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San Rafael

Draft Resource Management Plan/ Environmental Impact Statement

U. S. Department of the Interior
Bureau of Land Management
Utah State Office
Moab District
San Rafael Resource Area

Volume One

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ORIGINAL

COMPLETED

FOREWORD

American citizens, through the Federal Government, own about one-third of the land in the United States. This land is managed by various government agencies, one of which is the Bureau of Land Management (BLM). Land managed by BLM is called "public land."

In the West, BLM is administered in state organizations; the public lands in each state are divided into districts and then into smaller resource areas.

The public lands are managed for multiple use--that is, for the many and varied public uses and interests. Individuals, companies, or other government agencies may want to

- use the land surface: build a road, put in a pipeline, buy land to expand local communities;
- use what the land has: drill for oil or water, cut firewood, graze cattle, look for agate;
- study the land and its resources: measure water quality, test geologic structures, excavate archaeological ruins, examine rare cactus;
- or simply enjoy the land: drive across the desert, climb the jagged cliffs, or watch wild horses gallop through the grasslands.

BLM managers need to know where any of these uses would conflict. Sometimes they must choose among conflicting uses or decide which resources should be produced or protected. In other cases, many different kinds of uses can occur side by side without special rules or designations.

This draft resource management plan/environmental impact statement (RMP/EIS) describes resources and opportunities present in the San Rafael Resource Area in Emery County, Utah and the Forest Planning Unit of the Sevier River Resource Area in Sevier County, Utah. It discusses grazing management in part of the Henry Mountain Resource Area in Wayne County, Utah, as well as in the other two areas. The RMP/EIS shows six different alternative plans for managing those resources. It explains what the BLM land managers expect would happen if the public lands were managed in those different ways, and which way they believe is best.

Alternative A describes current management. Alternative B shows how the different uses would be regulated if production of minerals and livestock were emphasized. Alternative C emphasizes management for wildlife habitat and nonmotorized recreation opportunities; alternative D emphasizes watershed values and cultural resources; and alternative E emphasizes motorized recreation opportunities. Alternative F shows the BLM managers' preference, with most of the actions selected from the other five alternatives.

After analyzing the public comments received on this draft and making any needed changes, BLM will publish a proposed RMP and final EIS. That document will contain the changes necessary to reflect public concerns. After it is reviewed, the RMP and Record of Decision will be printed, and BLM will start to use the new plan to guide use of your public lands and resources. (To have a complete record, you will need to keep this draft RMP/EIS.)

Your participation is an important part of BLM's planning process. You are not being asked to "vote" for one of the alternatives presented in chapter 2, but BLM needs to know why you think the public lands should or should not be used in the ways presented in the alternatives. You may want to pay particular attention to alternative F, the agency's preferred alternative. The most effective comments will be those that present information about the basic resources described in chapter 3 or give reasons to support or challenge the conclusions presented in chapter 4.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Moab District
P. O. Box 970
Moab, Utah 84532

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(U-060

August 1988

Dear Reader:

The Bureau of Land Management (BLM) has prepared this draft resource management plan/environmental impact statement (RMP/EIS) for your review and comment. It covers the San Rafael Resource Area, Moab District, and the Forest Planning Unit of the Sevier River Resource Area, Richfield District. The draft RMP/EIS outlines six alternatives for managing about 1.5 million acres of public land and resources in Emery and Sevier Counties in southeast Utah. The alternatives also address grazing management on about 134,100 acres in Wayne County, Utah.

We invite you to review this document and provide us with your comments. To be most useful, your comments should focus on the merits of the alternatives described in chapter 2; the factual basis for the description of the affected environment, found in chapter 3; or the results of the impact analysis in chapter 4.

All comments will be considered in the final EIS. Written comments will be printed in that document, along with the BLM's response. The final EIS may be printed in an abbreviated format; therefore, you may wish to keep this draft for future reference.

Four open houses will be held to discuss this draft RMP/EIS. BLM staff will be available to answer any questions you may have. The dates and locations are as follows:

Date	City	Location
September 20	Castle Dale	Courthouse
September 22	Green River	Tamarisk Inn
September 27	Huntington	City Hall
September 29	Salt Lake City	Salt Palace

All four open houses will be held from 3 to 8 p.m.

To be considered in the final EIS, written comments should be received within 90 days following the Environmental Protection Agency's notice in the Federal Register of this plan's availability. Please address comments to:

Jim Dryden, San Rafael Resource Area Manager
Bureau of Land Management
900 North 700 East
Price UT 84501
Attention: RMP

Additional copies of this document may be obtained by calling (801) 637-4584. If you have any questions about the draft, please feel free to contact the San Rafael Resource Area office at the phone or address shown here. When this RMP is final, it will guide management of the public lands involved. Your informed participation in submitting a written comment is very important.

Thank you for your interest in public land management.

Sincerely yours,

District Manager

II

SAN RAFAEL

DRAFT RESOURCE MANAGEMENT PLAN and ENVIRONMENTAL IMPACT STATEMENT

Prepared by

U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Moab District, Utah

August 1988

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III

SAN RAFAEL

DRAFT RESOURCE MANAGEMENT PLAN and ENVIRONMENTAL IMPACT STATEMENT

Volume 1

Draft Plan and Impact Analysis: Text and Tables

(Volume 2 contains Maps and Appendixes)

August 1988

U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Moab District. Utah

III

SAN RAFAEL

DRAFT RESOURCE MANAGEMENT PLAN and ENVIRONMENTAL IMPACT STATEMENT

(X) Draft ( ) Final

Lead Agency

U.S. Department of the Interior, Bureau of Land Management

Type of Action

Administrative (X) Legislative ( )

Abstract

This draft resource management plan and environmental impact statement addresses alternatives for managing approximately 1.5 million acres of public land administered by the Bureau of Land Management, San Rafael Resource Area, Moab District, in Emery County, Utah and the Forest Planning Unit, Sevier River Resource Area, Richfield District, in Sevier County, Utah. The draft environmental impact statement also covers certain grazing management decisions in the Henry Mountain Resource Area, Richfield District, in Wayne County, Utah.

The document describes and analyzes the environmental consequences that would be expected to result from implementing each of the six alternatives. Each alternative has a different management emphasis and contains different land use prescriptions.

When the resource management plan is published in final form, it will provide comprehensive multiple use guidance for allocating and managing public resources throughout the San Rafael Resource Area and the Forest Planning Unit of the Sevier River Resource Area.

Comments

Comments on the alternatives, affected environment, or impact analysis presented in this document are requested from the public and from federal, state, and local agencies. To be considered in the final document, comments should be received within 90 days following the Environmental Protection Agency's notice of this document's availability in the Federal Register. Address comments to:

James Dryden, San Rafael Resource Area Manager
Bureau of Land Management
900 North 700 East
Price, UT 84501

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SUMMARY

INTRODUCTION

The San Rafael Resource Management Plan (RMP) is being prepared as required by the Federal Land Policy and Management Act of 1976 (FLPMA) in accordance with the Bureau of Land Management (BLM) planning regulations (43 CFR 1600). The RMP is also being prepared to meet a court-ordered requirement for preparation of a grazing environmental impact statement (EIS) for the San Rafael Resource Area (SRRA).

The RMP will guide management of all public lands and resources administered by SRRA. The SRRA, part of the Moab District, covers the southern half of Emery County, Utah. The Forest Planning Unit (FPU), part of the Richfield District, covers the southeastern corner of Sevier County, Utah. These areas together make up the planning area. Eight large pocket maps are provided in volume 2 of this draft RMP/EIS

Pocket Map	Title
A	Land Ownership
B	Existing Livestock Grazing Management
C	Alternative F Generalized Land Use Management Zones
D	Alternative F Areas of Critical Environmental Concern
E	Alternative F Right-of-Way Corridors and Avoidance/ Exclusion Areas
F	Alternative F Grazing Actions
G	Alternative F Off-Road Vehicle Use Designations
H	Alternative F Visual Resource Management Classes

The RMP/EIS will provide decisions on livestock use for most of the public lands in the planning area, as well as some public lands in the Henry Mountain Resource Area, Richfield District, in Wayne County, Utah.

This RMP also discusses BLM's role in administering certain resources on lands administered by the U.S. Forest Service and the National Park Service.

PLANNING DOCUMENTS

Five documents are prepared to record the RMP process. The preplanning analysis was completed in September 1985, and Supplement A was added in June 1986. The management situation analysis (MSA) was completed in April 1988. This draft EIS was completed in July 1988. The proposed RMP and final EIS is scheduled for publication in May 1989.

PLANNING ISSUES

A total of five planning issues or resource management questions were identified. They concern management of livestock; wilderness study areas (WSAs) if not designated as wilderness; recreation; wildlife habitat; and watershed. The five planning issues were used to develop the alternatives for this draft EIS.

MANAGEMENT OPPORTUNITIES

The MSA analyzed the adequacy of current management and identified opportunities for improvement, either through administrative changes or through the RMP/EIS.

MANAGEMENT COMMON TO ALL ALTERNATIVES

Management practices that were determined adequate, based on the analysis in the MSA, will not be changed. Some administrative changes will be made based on the management opportunities identified in the MSA. Together these are management actions common to all alternatives, considered to be part of every alternative.

ALTERNATIVES ASSESSED

The alternatives analyzed in this draft EIS present different ways of answering the questions raised by the planning issues. These answers were used to formulate specific management actions under each alternative.

Six alternative plans are considered in detail in this EIS. Each plan presents guidance for all resource programs managed by BLM in the planning area. Except for alternative A, which presents continuation of current management, each plan presents different levels of management that would be applied to all public land uses.

SPECIAL DESIGNATIONS AND STANDARD OPERATING PROCEDURES

Special stipulations or conditions were developed for the other alternatives and are part of the alternatives in this draft EIS. Where no special stipulations were developed, it was assumed that the standard operating procedures would be applied.

ALTERNATIVE A

The goal of alternative A is to continue the present levels of management and use of public lands and resources directed by the management framework plans (MFPs) [BLM, 1977a and BLM, 1979a]. In some instances, this involves continual development or expansion for the 12-year planning horizon. However, the current MFPs are inadequate to direct management of most public resources. This leaves the manager without clear guidance or objectives to respond to public requests and resource management needs. Even so, alternative A represents a fairly balanced combination of uses. The SRRA staff includes three range conservationists, one wildlife biologist, one recreation specialist, one realty specialist, one mining engineer, one geologist, one surface protection specialist, one watershed specialist, one archaeologist, and the administrative support required to manage the resource programs. The estimated annual costs of implementing alternative A would be $1,105,900.

ALTERNATIVE B

Alternative B would attempt to maximize the amount of livestock grazing and mineral production while providing for right-of-way corridors to aid development. Map 1 shows the area on which uses would be restricted to protect designated unique rangeland values in relict vegetation areas of critical environmental concern (ACECs) and 30 acres of cultural resource sites. Sustained yield of forage for livestock would be provided, while habitat for wildlife and wild horses and burros would be managed at levels below potential. Watershed management programs would be used to support livestock and mineral development needs, and recreation use would be managed to prevent conflict with those uses. Average grazing use would increase about 71 percent. While it is expected that mineral exploration and mining would increase because of less restriction, little change in production is expected. The cost of implementing alternative B is estimated to be 25 percent higher than for alternative A.

ALTERNATIVE C

Increasing opportunities for nonmotorized recreation and protection of wildlife habitat would be the primary goals of alternative C (map 2). Scenic ACECs at San Rafael Canyon, San Rafael Reef, Muddy Creek, Segers Hole, Sids Mountain, and Gilson Buttes, totaling 246,500 acres, would be established with management emphasis on primitive values (closed to off-road-vehicle (ORV) use). In the scenic corridor along Highway I-70, where ORV use would be limited to existing roads and trails, management would favor nonmotorized recreation values. Four cultural and historic ACECs and two relict vegetation ACECs (23,740 acres) would also be closed to ORV use. These use restrictions would protect crucial habitat for bighorn sheep and antelope, while restrictions on livestock grazing would protect crucial winter habitat for mule deer and elk and enhance riparian and aquatic habitat areas. Management costs under alternative C are projected to be 25 percent higher than for alternative A.

ALTERNATIVE D

The goals of alternative D (map 3) are (1) to provide for the maximum watershed condition by minimizing surface disturbance in critical watershed areas and (2) to provide the maximum protection of cultural resources. Although grazing would be allowed to continue on all but 5,400 acres of the planning area, limitations on forage use to protect watershed values would substantially reduce the average livestock use to about 30 percent of the maximum level under alternative B and to about half of that allowed under alternative A. Wildlife use would be allowed to increase, so long as maximum watershed condition is maintained. The ACECs nominated under alternative C would also be designated under alternative D, and the Hebes Mountain, Pictographs, Swasey Cabin, and Little Black Mountain areas would be added. Mineral exploration and development activities would be restricted to protect critical watersheds and ACECs. Management cost would be an estimated $1,258,900 (12 percent over that for alternative A).

ALTERNATIVE E

Alternative E (map 4) was designed to maximize access and the opportunities for motorized recreation. Livestock and wildlife grazing would be managed to accommodate motorized recreation by adjusting grazing seasons and use levels where conflicts develop. Wild horse and burro ranges would be expanded to allow animals to disperse to areas not frequently used by motorized vehicles. Watershed protection would not exclude ORV use, and other recreation programs would be subordinate to ORV recreation. Mining activities would be managed to enhance motorized recreation opportunities. In eight areas (156,910 acres) designated for ACEC management, ORV use would be limited to either existing or designated roads and trails. The estimated annual management cost under alternative E would be $1,297,800.

ALTERNATIVE F

Alternative F (map 5) is the agency's preferred alternative. Its stated goals are (1) to provide for protection of critical soils throughout the planning area and scenic resources within San Rafael Swell; (2) to protect crucial wildlife habitat; (3) to provide special management for certain vegetation and cultural resource values; and (4) to maintain existing livestock and mineral uses where no conflict with the other listed goals would occur. Waiver of stipulations in areas of scenic values would be based on an environmental assessment. All but three of the ACECs nominated in other alternatives would be designated under alternative F (Hebes Mountain, Little Black Mountain, and Gilson Buttes would not be designated). Alternative F would require more intensive management of all resources than is presently provided; this is reflected in the estimated management cost of $1,501,200 (25 to 30 percent over that for alternative A).

ENVIRONMENTAL CONSEQUENCES

This draft RMP/EIS analyzes the impacts to the human environment that would be expected to occur by the year 2000 if management actions identified under the various alternatives were implemented.

All alternatives would meet the requirements of the National Environmental Policy Act (NEPA) and other laws, regulations, and policies related to environmental quality. However, because the alternatives are quite different, each presents a result that would be environmentally preferable for different components of the human environment. Table 1 shows a brief comparison of impacts from the six alternatives.

PUBLIC REVIEW AND COMMENT

This draft EIS is being issued for formal review and comment of agencies, organizations, and individuals. The comment period will last for 90 days.

Public comments will be printed in the proposed RMP and final EIS, along with the BLM's response. The proposed RMP and final EIS will contain corrections and changes, but unless major revisions are required, the entire text will not be reprinted. Reviewers should retain this draft RMP/EIS to provide a complete record of the EIS process. Comments should be addressed as shown in the cover letter printed at the front of this volume.

TABLE 1

Abbreviated Summary Comparison of Impacts, by Alternative
(By the Year 2000)

Indicator	Unit	Current Situation	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Oil and Gas								
Category 1 area	ac.	1,182,050	1,182,050	1,491,400	193,710	172,330	471,810	761,776
Category 2 area	ac.	61,400	61,400	45,730	842,290	85,590	908,560	526,640
Category 3 area	ac.	174,630	174,630	0	30,370	0	156,910	245,810
Category 4 area	ac.	121,110	121,110	2,060	472,820	1,281,270	1,910	4,970
Oil production	Bbls/yr	0	13,200	13,200	13,200	3,000	13,200	13,200
Gas Production	MCF/yr	44,738	754,000	754,000	754,000	244,000	754,000	754,000
Seismic Line	mi/yr	100	100	125	100	25	100	100
Coal								
Exploration Area	ac.	62,290	58,310	62,290	58,310	18,470	62,290	62,280
Lease Area	ac.	58,190	58,190	58,190	54,210	14,370	58,190	58,180
Production	T/yr	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Mineral Materials								
Disposal area	ac.	1,539,190	1,539,190	1,537,130	1,032,150	257,920	1,380,370	1,288,410
Production	cu yd/yr	164,195	320,000	320,000	320,000	50,000	320,000	320,000
Locatable Minerals								
Area open to entry	ac.	1,539,190	1,537,410	1,535,350	1,064,590	257,120	1,535,500	1,532,440
Soils								
Loss	avg T/yr	33,775,070	34,324,020	33,243,520	27,700,740	27,027,680	28,723,810	30,841,040
Water								
Sediment Yield	avg T/yr	13,510,020	13,729,605	13,297,410	11,080,295	10,811,065	11,489,525	12,336,415
Salt Yield	avg T/yr	226,515	230,194	222,945	185,791	181,335	192,569	206,254
TDS	mg/l	unquantified	unquantified	unquantified	unquantified	unquantified	unquantified	unquantified
Vegetation								
Disturbance	ac.	54,544	54,544	17,384	25,699	8,416	48,164	39,824

Wild Horses and Burros								
Habitat area	ac.	475,680	475,680	475,680	475,680	475,680	[a]475,680	475,680
Population	horses	200 to 235	200 to 235	20 to 35	70 to 110	90 to 115	250 to 325	75 to 125
	burros	70 to 100	70 to 100	10 to 35	25 to 60	50 to 70	110 to 140	30 to 70
Desert bighorn sheep								
Crucial habitat	ac.	109,600	150,000	120,000	200,000	175,000	140,000	174,590
Population	sheep	225	500	350	860	750	550	800
Antelope								
Habitat	ac.	507,340	507,000	506,320	507,000	507,000	506,680	506,660
Population	antelope	600	700	400	1,060	1,000	950	900
Mule deer								
Crucial habitat	ac.	35,510	35,000	33,710	70,000	75,500	35,000	36,760
Population	deer	6,100	6,620	4,870	9,200	9,200	6,450	8,320
Elk								
Crucial habitat	ac.	18,200	18,200	17,700	28,000	28,400	17,700	18,960
Population	elk	550	600	410	750	750	590	730
Riparian Habitat	ac.	14,770	14,780	14,780	14,980	15,030	14,780	14,930
Livestock Grazing								
Grazing area	ac.	1,618,940	1,612,120	1,620,820	1,535,480	1,523,630	1,609,050	1,606,320
Average use	AUMs	56,871	56,161	96,006	45,380	28,682	55,102	55,751
Active preference	AUMs	88,252	87,542	96,006	72,758	44,258	86,528	86,198
Forest product use area								
Standard Conditions	ac.	451,270	430,890	437,450	24,590	100,690	220,300	169,190
Special Conditions	ac.	0	4,770	0	180,820	201,130	197,570	206,110
Campfire use excluded	ac.	0	490	510	1,100	6,800	510	570
Harvest excluded	ac.	0	15,610	13,820	245,850	149,450	251,250	75,960

(Continued)

TABLE 1 (Continued)

Indicator	Unit	Current Situation	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Cultural Resources								
Sites damaged	Sites	undetermined	6,735	6,712	6,060	1,507	6,738	6,707
Sites protected	Sites	1,500	2,489	2,530	2,477	2,385	2,489	2,489
Area Meeting Recreation Opportunity Spectrum Criteria								
P class	ac.	117,720	69,680	18,650	114,220	114,240	31,380	81,500
SPNM class	ac.	249,190	183,410	194,650	231,140	232,950	186,910	211,700
SPM class	ac.	743,800	662,870	629,060	603,400	716,250	675,550	630,920
RN class	ac.	434,260	606,720	684,580	581,420	471,440	626,110	599,810
R class	ac.	3,480	10,670	12,210	10,500	5,260	11,410	10,630
U class	ac.	40	20	40	20	30	20	20
ORV Recreation Area								
Open	ac.	1,539,190	1,539,190	0	194,640	172,360	1,380,870	761,820
Seasonal restrictions	ac.	0	0	0	246,700	84,770	0	61,060
Existing roads and trails	ac.	0	0	1,493,230	0	0	156,910	0
Designated roads and trails	ac.	0	0	43,940	606,110	840	1,410	711,840
Closed to ORV use	ac.	0	0	2,020	491,740	1,281,220	0	4,470
Visual Resource Management Class Area								
Class I	ac.	0	0	0	472,130	430,450	135,730	231,750
Class II	ac.	496,370	496,370	496,370	725,940	168,220	959,610	288,240
Class III	ac.	383,270	383,270	383,270	166,850	345,540	199,590	364,040
Class IV	ac.	659,550	659,550	659,550	174,270	594,980	244,260	655,160
Contrasts exceeding objectives	Scores	120	120	150	106	67	136	118
Lands available for rights-of-way								
Within corridors	ac.	0	0	27,340	0	0	17,060	24,440
Outside corridors	ac.	1,539,190	1,485,600	1,464,060	193,710	172,330	454,750	752,760
Avoidance areas	ac.	0	53,590	45,760	872,660	85,590	1,065,470	757,020
Exclusion areas	ac.	0	0	2,030	472,820	1,281,270	1,910	4,970

Lands								
Managed for disposal	ac.	6,820	6,820	0	6,970	1,420	7,810	7,730
Withdrawals	ac.	1,780	1,780	3,840	474,600	1,282,070	3,690	6,750
Acquisitions	ac.	0	0	0	8,580	2,400	0	3,200
Economic Considerations								
Oil and Gas								
Employment	Jobs	353	353	359	353	80	353	353
Earnings	$	9,962,600	9,962,600	10,123,287	9,962,600	2,249,619	9,962,600	9,962,600
Revenues	$	135,730	135,730	137,920	135,730	30,649	135,730	135,730
Mineral Material								
Employment	Jobs	3	3	3	3	5	3	3
Earnings	$	55,349	55,349	55,349	55,349	8,515	55,349	55,349
Revenues	$	3,902	3,902	3,902	3,902	600	3,902	3,902
Mining Law								
Employment	Jobs	4	4	6	3	3	3	4
Earnings	$	75,257	75,257	112,886	56,443	56,443	56,443	75,257
Revenues	$	7,203	7,203	10,805	5,402	5,402	5,402	7,203
Soil and Water								
Sediment Cost	$	218,000 to 1,840,100	218,000 to 1,840,100	206,500 to 1,755,200	171,500 to 1,458,000	170,200 to 1,451,500	177,800 to 1,512,800	190,650 to 1,626,800
Salinity Cost	$	1,724,000 to 25,208,600	1,724,000 to 25,208,600	1,573,100 to 24,081,000	1,296,200 to 20,010,800	1,289,000 to 19,927,200	1,375,200 to 20,724,900	1,455,800 to 22,303,900
Livestock Grazing								
Returns above variable cost	$	912,200	912,200	1,759,000	355,700	113,900	637,500	690,300
Wealth	$	26,392,700	26,392,700	26,851,400 to 28,420,500	25,889,200	25,125,300	26,375,300	26,407,700
Employment	Jobs	156	156	228	124	57	154	148
Earnings	$	459,500	459,500	671,600	365,900	66,700	453,900	435,400
Revenues	$	319,400	319,400	466,900	254,400	115,900	315,600	302,700
Recreation								
Employment	Jobs	27	27	20	36	37	27	31
Earnings	$	236,700	236,700	186,700	314,100	323,700	232,900	275,900
Revenues	$	35,400	35,400	27,870	47,200	48,800	34,800	41,400
Wildlife								
Employment	Jobs	20	20	14	28	30	19	24
Earnings	$	174,600	174,600	124,300	251,700	261,300	170,500	213,500
Revenues	$	26,800	26,800	19,100	38,700	40,100	26,200	32,800

(Continued)

TABLE 1 (Concluded)

Indicator	Unit	Current Situation	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Economic Considerations (Concluded)								
Other Land Uses								
Employment	Jobs	36	36	unquantified	unquantified	9	unquantified	unquantified
Earnings	$	494,800	494,800	unquantified	unquantified	118,744	unquantified	unquantified
Revenues	$	45,400	45,400	unquantified	unquantified	10,832	unquantified	unquantified
Payments in Lieu of Taxes	$	8,600	8,600	1,800	8,800	3,200	9,600	9,600
Plan Budget								
Employment	Jobs	9	9	12	12	10	10	12
Earnings	$	105,700	105,700	138,000	137,500	120,300	124,000	143,500
Revenues	$	2,400	2,400	3,100	3,100	2,700	2,800	3,200

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Introduction

INTRODUCTION

PURPOSE AND NEED

The purpose of the resource management plan (RMP) is to guide management of the public lands and resources in the Moab District's San Rafael Resource Area (SRRA) and Richfield District's Forest Planning Unit (FPU), which is part of the Sevier River Resource Area (map 6). Section 202 of the Federal Land Policy and Management Act of 1976 (FLPMA) directs the Secretary of the Interior to develop, maintain, and revise land use plans for management of the public lands and their resources. Accordingly, the Bureau of Land Management (BLM) is required to develop and implement an RMP for each resource area.

The RMP will replace the existing management framework plans (MFPs) for SRRA [BLM, 1979a] and FPU [BLM, 1977a]. It will be reviewed at 5-year intervals and revised or amended as necessary.

This RMP/EIS will also fill the needs of the court-ordered grazing environmental impact statement (EIS) [U.S. District Court, District of Columbia, in Natural Resources Defense Council, Inc. v. Morton, 388 F.Supp. 829 (1974). In Natural Resources Defense Council Inc. v. Andrus, 488 F.Supp. 802 (D.D.C. 1978)]. It reviews and, where necessary, revises management of grazing uses on public lands in the grazing area. The court called for completion of all grazing EISs by 1988. Livestock management is identified as a required issue for alternative formulation.

FLPMA and the National Environmental Policy Act (NEPA) require BLM to seek public involvement at several steps in the development of the RMP/EIS. This RMP/EIS affords the public an opportunity to review the thinking and rationale behind the many decisions leading to the RMP. Through public involvement it is hoped that the RMP will be sensitive to the public land uses in the planning area and to the concerns of its users.

THE PLANNING PROCESS

BLM planning is described as issue-driven, meaning that planning is undertaken to answer questions about specific land management opportunities or problems, called issues. The issues are identified at the outset of the RMP process and posed as questions regarding use or management of the public lands.

The different ways of answering these questions provide the bases for the alternatives considered in the draft, and the RMP/EIS finally decided upon is shaped by the manager's answers to those questions. The RMP/EIS is written to provide program-specific guidance to cover management of all resources throughout the entire planning area. It will, therefore, include an overview of management common to all alternatives.

Under the planning regulations at 43 CFR 1610.4, the preparation and implementation of an RMP is completed in nine steps (table 2). The RMP/EIS discloses these processes for public and administrative review.

The first three planning steps require information gained from many sources, including the public. Steps 4 and 5 depend on analysis of the data and needs identified in the first three steps. Step 5 leads into the EIS process (steps 5 through 8), which calls for formal public review and comment periods.

TABLE 2

Prescribed Resource Management Planning Actions

INFORMATION

1. Identification of issues *
2. Development of planning criteria *
3. Inventory data and information collection
4. Analysis of management situation

ANALYSIS

5. Formulation of alternatives
6. Estimation of effects of alternatives
7. Selection of preferred alternative *

DECISION

8. Selection of resource management plan *

IMPLEMENTATION

9. Monitoring and evaluation

* Public participation is invited throughout the planning process, but is formally requested at these steps.

Source: BLM Manual 1601.22.

The final planning step requires monitoring and evaluation; formal review takes place at 5-year intervals. The monitoring plan for the San Rafael RMP is described in appendix A. Public reaction to BLM's land mangement can lead to revision of the RMP through these periodic reviews. Public concerns voiced through changes in law or agency policy also serve as bases for planning decisions. A public participation plan for the San Rafael RMP effort was presented in the preplanning analysis.

Five documents are completed during preparation of the RMP to record the planning process: the preplanning analysis; the management situation analysis (MSA); the draft RMP/EIS; the proposed RMP and final EIS; and the record of decision (ROD) and RMP/rangeland program summary (RPS). Each document serves as a foundation for the one following. The relationship of the MSA, EIS, and final RMP is shown in figure 1.

PREPLANNING ANALYSIS

The preplanning analysis documents planning steps 1 and 2: identification of issues and development of planning criteria. The scoping requirement for preparation of an EIS (found at 40 CFR 1501.7) is the equivalent of issue identification. The public was given a 30-day period, ending on July 1, 1985, to comment on planning issues, the scope of the EIS, and the coal resource information for the San Rafael RMP effort. A public scoping meeting was held June 13, 1985 at Castle Dale, Utah.

The preplanning analysis also provides information pertaining to future documents, team organization, and schedules. It informs BLM personnel, other government agencies, and the public of the planning effort and is provided to the public as an information document. The preplanning analysis for the San Rafael RMP was prepared in September 1985; supplement A was prepared in May 1986 to finalize the planning criteria and to incorporate FPU into the planning area. Copies may be reviewed at the district and resource area offices.

MANAGEMENT SITUATION ANALYSIS

The MSA documents planning steps 3 and 4: collection of inventory data and analysis of the management situation. It is available for public inspection in the BLM district and resource area offices, but not printed or distributed for public review. The MSA details the physical profile for base resources and facilities within the planning and grazing areas and analyzes resource management programs administered by the resource areas. Existing management practices under the MFPs are described for each program, and the capability of the resource to meet present and future demands is assessed. Current management practices that appear adequate, and where no management concerns or conflicts are identified, may be carried forward into the final plan virtually intact. Problems identified in the MSA are analyzed to determine first if they can be resolved administratively. Administrative changes may be formulated and carried into the RMP. Problems that involve establishing or adjusting land use or resource allocations are carried through the EIS process for resolution.

The MSA identified management opportunities that could be resolved either administratively or through the RMP (table 3). Figure 1 is a schematic chart showing the purpose of the MSA and its relationship to the RMP and EIS.

DRAFT RESOURCE MANAGEMENT PLAN/ENVIRONMENTAL IMPACT STATEMENT

The draft RMP/EIS documents planning steps 5 through 7: formulation of alternatives, estimation of effects of those alternatives, and selection of the preferred alternative. The no-action alternative described in the draft RMP is the current management under the MFPs or subsequent planning documents.

Various alternatives are formulated to resolve the planning issues (problems or opportunities) identified in step 1. These are measured against the no-action alternative to estimate the differences in environmental effects (impacts). The draft EIS analyzes the alternatives and presents BLM's preferred alternative; it is distributed for a formal public review and comment period.

PROPOSED RESOURCE MANAGEMENT PLAN AND FINAL ENVIRONMENTAL IMPACT STATEMENT

After the public comments are analyzed, the proposed RMP and final EIS are written. The proposed RMP, which may differ from the draft preferred alternative, will be reviewed by the Governor for consistency with state plans. The proposed RMP and final EIS are subject to public protest through a formal procedure explained at 43 CFR 1610.5-2.

RECORD OF DECISION/FINAL RESOURCE MANAGEMENT PLAN/RANGELAND PROGRAM SUMMARY

To complete step 8, documentation of the RMP/EIS, an ROD is published with the final RMP. The ROD is not normally subject to public review, but may be if the final RMP differs substantially from the proposed RMP because of protest resolution or as a result of the Governor's review.

The final RMP provides the BLM field office with resource management guidance, by program, that is taken either directly from the current management described in the MSA, from resolution of administrative problems identified in the MSA, or from resolution of the planning issues through the RMP/EIS.

Monitoring and evaluation of the final RMP, step 9, will follow a set schedule and will be documented through plan supplements, amendments, or addenda. BLM policy requires an RPS to brief the public on range management decisions described in the final RMP and ROD, as well as monitoring by grazing allotment. To streamline procedures and reduce paperwork, the RPS will be combined with the ROD and final RMP.

GEOGRAPHIC SETTING

The San Rafael RMP/EIS covers both SRRA and FPU of the Sevier River Resource Area. For grazing purposes it extends into the Henry Mountain Resource Area, Richfield District.

THE PLANNING AREA

SRRA, within the Moab District, is responsible for management of BLM-administered lands and resources in the southwestern two-thirds of Emery County in central Utah (map 7). The resource area is bordered by the Emery County line on the west and south, the Green River on the east, and an irregular line on the northeast which extends roughly northwest from just south of the town of Green

TABLE 3

Summary of Management Opportunities Identified in Management Situation Analysis

Resource Management Program	To Be Resolved Through RMP	To be Resolved Administratively	Prospective ACECs Identified
4111 Oil and Gas Leasing (Public Lands)	Evaluate and adjust lands in existing oil and gas leasing categories.	Review KGSs.	None identified.
4113 Geothermal Resources Management	Identify lands to be closed to or remain open for geothermal lease (defer until public interest in leasing develops).	None identified.	None identified.
4121 Coal Leasing	Identify lands to be closed to or remain open for coal leasing. Prepare coal leasing unsuitability study.	None identified.	None identified.
4122 Tar Sand Leasing	Evaluate and adjust lands in CHL categories.	None identified.	None identified.
4131 Mineral Materials	Identify areas to be closed to or remain open for extraction of mineral materials.	Rehabilitate existing unreclaimed abandoned sites. Establish additional community pits.	None identified.
4132 Mining Law Administration	Identify potential mineral withdrawals or areas not to be withdrawn from mineral entry.	Rehabilitate existing unreclaimed abandoned uranium workings.	None identified.
4133 Mineral Leasing	Identify lands to be closed to or remain open for mineral lease.	None identified.	None identified.

4211 Rights-of-Way	Designate transportation and utility corridors. Define areas not to be used for transportation and utility corridors.	None identified.	None identified.
4212 Lands	Identify parcels for disposal.	Propose alternative lands actions where disposal or other long-range actions are precluded. Propose alternative lands actions to resolve unauthorized use or trespass.	None identified.
4220 Withdrawal Processing and Review	Identify potential withdrawals or areas not to be withdrawn. Identify classifications to be terminated.	None identified.	None identified.
4311 Forest Management	Define areas for use of various forest products.	Consider alternative means to achieve land treatments to enhance aesthetic values. Consider sequential use of proposed chaining areas. Consider potential for unconventional forest products.	None identified.
4312 Forest Development	None identified.	Consider forest development projects in areas where forest products are sold.	None identified.

(Continued)

TABLE 3 (Continued)

Resource Management Program	To Be Resolved Through RMP	To be Resolved Administratively	Prospective ACECs Identified
4322 Grazing Management	Adjust livestock management levels after completion of monitoring (within 5 years after RMP/EIS ROD) or in response to resource conflicts identified in the RMP. Identify allotments for development of AMPs. Summarize problem areas within specific allotments in RPS, following completion of RMP. Identify, evaluate, and designate areas for special management as ACECs to protect relict plant communities.	Consider adjustment of allotment boundaries.	Horse Bench Channel Gilson Buttes Sand Dunes Dry Lake Meander San Rafael Reef Salt Wash-Muddy Creek Triangle Hebes Mountain Keesle Country North Big Flat Top Bowknot Bend Link Flats
4331 Natural History/ Cultural Resources Management	Designate areas for special management as ACECs to protect important areas with natural history, paleontological, or cultural resource values. Develop management prescriptions to be used in developing and implementing cultural resource management plans (CRMPs). Develop and implement cultural resource management plans using management prescriptions developed in the RMP.	Prioritize staffing, funding, procurement, and program emphases to enhance, protect, and preserve cultural resources. Conduct a natural history/paleontological/ cultural resource inventory and mapping program.	Horse Bench Channel Gilson Buttes Sand Dunes Castle Dale Tempskya Vicinity Dry Lake Meander Little Black Mountain Intrusion Complex San Rafael Reef Derrs Channel Tomsich Butte Salt Wash-Muddy Creek Triangle Hebes Mountain Keesle Country North Big Flat Top Bowknot Bend Temple Mountain and Tomsich Butte Highway I-70 Pictographs Dry Lake Archaeological District

4332 Wilderness Management	Determine how WSAs and ISAs will be managed if not designated wilderness and dropped from the wilderness review by Congress.	None identified.	See 4322 and 4331.
4333 Recreation Management/ Visual Resources Management	Develop and implement management plans for all SRMAs using management prescriptions developed in the RMP. Identify areas to be maintained in each recreation opportunity spectrum (ROS) class. Identify and designate additional developed recreation sites. Designate all of the planning area as open, limited, or closed to ORV use. Identify, evaluate, and approve VRM classes.	Identify, evaluate, and designate additional SRMAs where needed. Prioritize staffing and funding for management of SRMAs. Monitor use and develop facilities within SRMAs. Support the suitability studies under the Wild and Scenic Rivers Act. Use VRM system in project planning and design.	I-70 Scenic Corridor Little Black Mountain San Rafael Reef Goblin Valley/Mollys Castle San Rafael Canyon Black Box Keesle Country/Tomsich Butte Buckhorn Wash Sids Mountain Segers Hole Muddy Creek
4341 Soil, Water, and Air	Identify areas that could benefit from projects to improve sensitive soils or watershed conditions through activity plans using management prescriptions developed in the RMP.	Collect inventory data to support watershed and air quality studies.	None identified.
4342 Hazardous Waste Management	None identified.	Conduct an inventory to identify hazardous waste sites, and develop means to meet agency policy regarding rehabilitation of these sites.	None identified.

(Continued)

TABLE 3 (Concluded)

Resource Management Program	To Be Resolved Through RMP	To be Resolved Administratively	Prospective ACECs Identified
4351 Habitat Management (Wildlife)	Identify habitat areas needing special protection and develop special conditions to be applied to other resource use activities. Identify, evaluate, and designate areas for special management to protect significant wildlife habitat values. Identify areas that would benefit from HMPs, and develop HMPs using management prescriptions developed in the RMP.	Inspect and maintain existing wildlife facilities.	Sids Mountain WSA Muddy Creek WSA Crack Canyon WSA San Rafael Reef WSA Mexican Mountain WSA Horseshoe Canyon North WSA unique riparian system. Sids Mountain WSA riparian ecosystem along San Rafael River. Riparian and aquatic areas totaling about 14,763 acres.
4352 Endangered Species Management	None identified.	Conduct inventories to determine and map the presence and extent of T/E species populations and habitats.	None identified.
4360 Fire Management	Identify fire suppression areas. Develop action plans to set parameters for different suppression areas, using management prescriptions developed in the RMP.	Conduct actions in specific areas to reduce fire hazard.	None identified.

TABLE 4

Land Surface Administration

Jurisdictional Unit	San Rafael Resource Area (acres)	Forest Planning Unit (acres)	Planning Area Total (acres)
FEDERAL OWNERSHIP			
BLM administered public lands	1,463,840	75,350	1,539,190
NPS	2,150	4,180	6,330
USFS	155,840	59,090	214,930
SUBTOTAL	1,621,830	138,620	1,760,450
STATE OWNERSHIP			
State Lands Commission	196,240	10,920	207,160
State Parks and Recreation	2,240		2,240
SUBTOTAL	198,480	10,920	209,400
PRIVATE OWNERSHIP	152,220	43,500	195,720
TOTAL	1,972,530	193,040	2,165,570

Source: BLM Records.

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TABLE 5

Management of Mineral Resources

ADMINISTRATION OF SURFACE ESTATE		ADMINISTRATION OF MINERALS ESTATE (acres)			
Managing Agency or Surface Owner	Acres Total Surface	Federal Minerals by BLM	Federal Minerals by Other Federal Agency	State Minerals by State	Private Minerals by Owner
SAN RAFAEL RESOURCE AREA					
BLM (Public Lands)	1,463,840				
Federal Minerals		1,463,840			
NPS (Capitol Reef NP)	2,150				
Federal Minerals			1,510		
State Minerals				640	
USFS (Manti-LaSal NF)	155,840				
Federal Minerals		[a]155,840			
State Ownership	198,480				
State Lands Commission	(196,240)			195,660	
Federal Minerals		480			
Federal Oil & Gas		80			
Federal Oil, Gas, & Coal		20			
State Parks (Goblin Valley SP)	(2,240)				
Federal Minerals		2,240			
Private Ownership	152,220				
Federal Minerals		7,630			
Federal Oil & Gas		1,090			
Federal Oil, Gas, & Coal		1,630			
State Minerals				7,890	
Private Minerals					133,980
SRRA TOTALS	1,972,530	1,632,850	1,510	204,190	133,980

FOREST PLANNING UNIT, SEVIER RIVER RESOURCE AREA					
BLM (Public Lands)	75,350				
Federal Minerals		75,350			
NPS (Capitol Reef NP)	4,180		2,900		
Federal Minerals				1,280	
USFS (Fishlake NF)	59,090				
Federal Minerals		[a]59,090			
State Ownership	10,920				
State Minerals				10,890	
Federal Oil & Gas		30			
Private Ownership	43,500				
Federal Minerals		2,210			
Federal Oil & Gas		320			
Federal Oil, Gas, & Coal		60			
Federal Coal		11,120			
Private Minerals					29,790
FPU TOTALS	193,040	148,180	2,900	12,170	29,790
GRAND TOTALS	2,165,570	1,633,080	160,250	208,470	163,770

NOTE: Split-estate lands are those where the surface and minerals estates are managed by different entities. Federal minerals managed by BLM will be carried into the RMP; other totals are for information only.

[a] BLM manages leasable minerals only.

Source: BLM records and Master Title Plats.

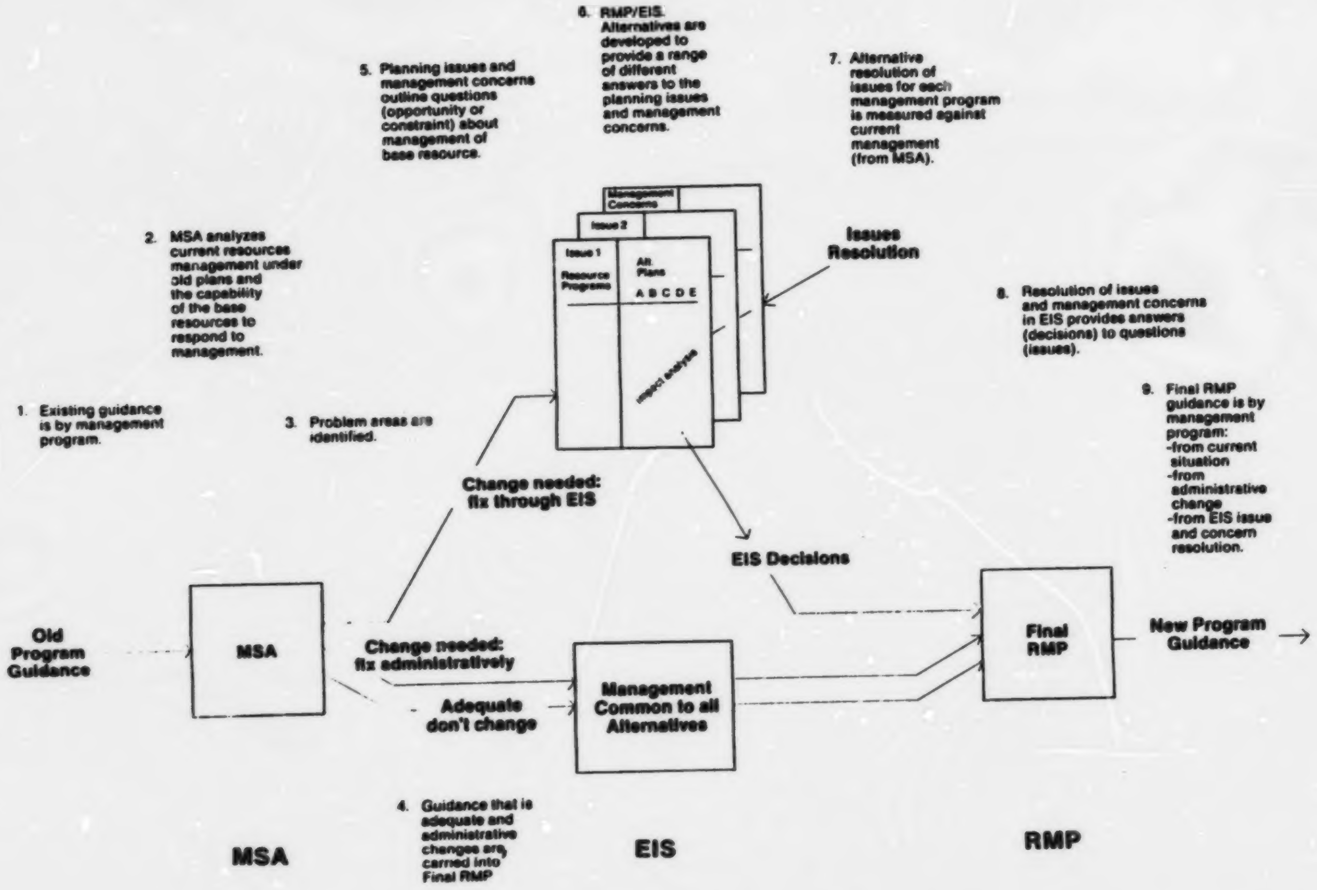
6. RMP/EIS.
Alternatives are developed to provide a range of different answers to the planning issues and management concerns.
5. Planning issues and management concerns outline questions (opportunity or constraint) about management of base resource.
7. Alternative resolution of issues for each management program is measured against current management (from MSA).
2. MSA analyzes current resources management under old plans and the capability of the base resources to respond to management.
Management Concerns
Issue 2
Issue 1
Resource Programs
Alt. Plans
A B C D E
Impact analysis
Issues Resolution
8. Resolution of issues and management concerns in EIS provides answers (decisions) to questions (issues).
1. Existing guidance is by management program.
3. Problem areas are identified.
9. Final RMP guidance is by management program:
-from current situation
-from administrative change
-from EIS issue and concern resolution.
Change needed: fix through EIS
EIS Decisions
Old Program Guidance
MSA
Change needed: fix administratively
Adequate don't change
Management Common to all Alternatives
Final RMP
New Program Guidance
4. Guidance that is adequate and administrative changes are carried into Final RMP
MSA
EIS
RMP

FIGURE 1

Relationship Between Planning Documents

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River, across the San Rafael Swell just north of the San Rafael River, to the Manti-LaSal National Forest (NF) northwest of the town of Huntington. Interstate Highway I-70 cuts across the center of SRRA, and State Highways U-10 and U-24 also cross the resource area. Several small communities lie along U-10 within the boundaries of SRRA. These include Castle Dale (the Emery County seat), Huntington, Clawson, Ferron, Emery, and Orangeville. The town of Green River is located just outside the SRRA boundary.

Sevier River Resource Area, within the Richfield District, is responsible for management of BLM-administered lands and resources in FPU (in the eastern portion of Sevier County (map 7)). FPU is bounded on the south and east by the Sevier County line and on the north and west by the Fishlake and Manti-LaSal NFs; some isolated public land inholdings within the NF boundaries are also included. Interstate Highway I-70 cuts across the center of FPU, and State Highway U-10 crosses FPU. There are no communities within FPU.

The public lands in the eastern part of FPU are in blocked ownership interspersed with regular state sections and small tracts of private land (map 8). Public lands in the western part of FPU are small, isolated tracts of 40 to 160 acres. They are interspersed with private land within the boundaries of Fishlake NF.

BLM is also responsible for management of some resources on lands administered by other federal agencies. BLM manages mineral uses, where allowed, on lands administered by National Park Service (NPS) and manages some aspects of federal minerals use on lands administered by the U.S. Forest Service (USFS).

MDO and SRRA administer underground operations of coal mines on both Manti-LaSal and Fishlake NFs. SRRA administers certain aspects of mining claims on the portion of Manti-LaSal NF in Emery County. Sevier River Resource Area administers certain aspects of mining claims on the portions of Manti-LaSal and Fishlake NFs in Sevier County.

Management of recreational use of the Green River, from the town of Green River to the north boundary of Canyonlands National Park (NP), is shared between SRRA and the Utah State Division of Parks and Recreation. SRRA administers recreational use of both banks of the river, including some area in the Grand Resource Area, Moab District.

Land surface administration within the planning area boundaries is shown in table 4 and on map 7. Table 5 shows mineral management responsibility compared to surface administration and gives the extent of split-estate lands within the planning area. Table 6 shows management responsibility for recreation.

TABLE 6

Management of Recreation Resources

Public Resource	Acres Administered by SRRA
Public lands	1,538,620
Green River, in Grand Resource Area	9,300
TOTAL	1,547,920

NOTE: Recreational use of the Green River from Green River State Park to Canyonlands NP is managed jointly with the Utah Division of State Parks and Recreation.

Source: BLM records.

THE GRAZING AREA

Grazing management in the majority of the planning area will be addressed in the RMP through the grazing EIS (map 9).

SRRA is responsible for administering grazing on certain public lands in Henry Mountain Resource Area, in the northeast corner of

Wayne County, east of Highway U-24. SRRA also administers grazing on the northern portion of FPU; Sevier River Resource Area administers grazing on the remainder of FPU and on the southwestern corner of SRRA. The draft RMP/EIS addresses grazing concerns on all of this area.

Henry Mountain Resource Area administers grazing on certain lands in the southern part of SRRA. These lands were addressed in the Henry Mountain Grazing EIS [BLM, 1983b]; grazing concerns on these lands are not addressed in the San Rafael Draft RMP/EIS, although other resource values are.

Additionally, there are small areas along the boundary with Price River Resource Area where either grazing on lands within Price River Resource Area is administered by SRRA or vice-versa. Grazing on areas within SRRA administered by Price River Resource Area was addressed in the Price River Grazing EIS [BLM, 1983a]; grazing concerns on these lands are not addressed in the San Rafael Draft RMP/EIS, although other resource values are.

BLM also manages grazing uses, where allowed, on NPS-administered land. Grazing is allowed on two units of NPS land within the area covered by the grazing EIS (map 9). SRRA administers grazing on part of Glen Canyon National Recreation Area (NRA) within Wayne County, adjacent to lands in Henry Mountain Resource Area where SRRA administers grazing. Grazing is currently allowed in Capitol Reef NP; a small part of this NP extends into SRRA and FPU. Grazing on most of this area is administered by Henry Mountain Resource Area and was addressed in the Henry Mountain Grazing EIS [BLM, 1983b]; grazing on a very small area adjacent to FPU is administered by Sevier River Resource Area.

Land surface administration within the grazing area boundaries is shown in table 7 and on map 9.

TABLE 7

Management of Grazing Resources

Jurisdictional Unit	Agency Total (Acres)
SAN RAFAEL RESOURCE AREA	
FEDERAL OWNERSHIP	
BLM administered public lands	1,409,100
National Park Service (Glen Canyon NRA)	12,780
FOREST PLANNING UNIT	
FEDERAL OWNERSHIP	
BLM administered public lands	190,240
TOTAL AREA COVERED BY THIS GRAZING EIS	1,612,120

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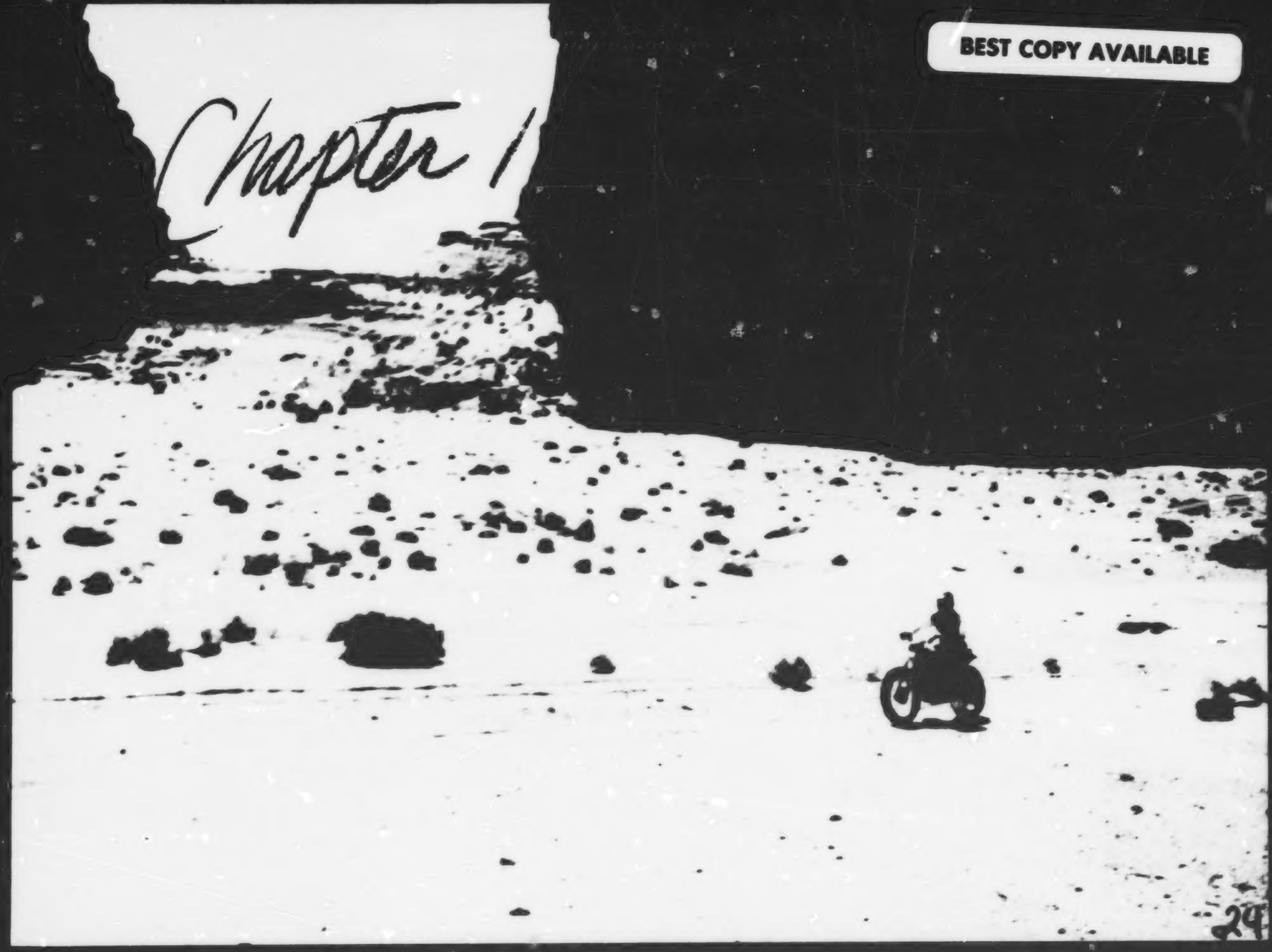
Chapter 1



CHAPTER 1, PLANNING ISSUES AND CRITERIA

OVERVIEW

The resource management plan (RMP) is developed to answer questions raised by specific planning issues and to continue to direct management where there are no issues. The answers are guided by planning criteria developed especially for this RMP.

The first planning step is issue identification. The planning issues in this draft RMP were selected by the resource area manager (43 CFR 1610.4-1) as management opportunities, problems, conflicts, and trade-offs to be addressed in and resolved through the environmental impact statement (EIS). In defining these issues, public input was considered along with management concerns of other agencies and direct knowledge of resource conditions by Bureau of Land Management (BLM) personnel.

Planning issues reflect resource problems that may involve more than one BLM management program. Issues may be required by state or national policy or may reflect conditions specific to this planning area. Identified issues are subject to change throughout the planning process.

Planning issues identify concerns that

- present an unresolved question regarding allocation of a specific resource;
- present major land use conflicts regarding management or maintenance of a base resource;
- can reasonably be resolved in alternative ways by BLM field managers;
- can be identified on a map; and
- are timely within the life of the plan.

Planning issues do not reflect concerns that

- require changes in laws, regulations, agency policies, or operating budgets;
- are subject to policy or procedures beyond the discretion of BLM field managers;
- are administrative problems;
- are more appropriately addressed in specific program activity plans subsequent to adoption of the RMP;
- are within the jurisdiction of another land management agency; or
- are emotional or political rather than resource-oriented.

Topics of interest to the BLM, other agencies, or the public, which do not qualify as planning issues, may be addressed as specific management concerns.

PLANNING ASSUMPTIONS

Development of the RMP is based on the following planning assumptions.

25

- The planning horizon will be 20 years. This period would generally be the maximum amount of time required for planning decisions as implemented to result in noticeable change to the base resources.

- The year 2000 is used as a common point in time for projection of future demands for public lands and resources and environmental impacts caused by implementation of any alternative assessed. This date falls within the scope of the planning horizon, yet is far enough from the anticipated implementation dates given in the RMP that alternative management actions would have had time to become effective.

- Funding and personnel will be sufficient to carry out any alternative selected.

- Management of lands administered by another federal agency, and management of public lands in the planning area by other agencies or BLM offices, will be in accordance with memorandums of understanding or other written agreements now in place.

- The plan will not address management of any surface uses on state or private lands or of nonfederal minerals.

- The plan will assume continuation of existing patterns of state and federal land ownership for this RMP. A plan amendment will be prepared if necessary in the event of state indemnity selections that would alter federal/state ownership, or if federal legislation is enacted which would block up state lands, or if federal legislation is enacted that would set aside lands under special designation, or would transfer management of public lands or resources from the BLM.

PLANNING ISSUES

The following have been identified as planning issues (planning questions) for the San Rafael RMP/EIS:

LIVESTOCK MANAGEMENT

Livestock grazing use of public lands within the planning area is traditional; however, past and present patterns of forage utilization have caused uneven use of the range resource, loss of forage productivity in some areas, improper distribution of livestock, and conflicts with other resource uses. An analysis is needed, on an allotment basis, to determine whether stocking levels, seasons of use, or range management practices need to be changed. Current or potential conflicts are seen with wildlife use of forage (primarily mule deer and desert bighorn sheep), with land developments removing areas from forage production (primarily oil and gas exploration and field development), and with preservation of relict or ecologically unique plant communities. Resolution of this issue should satisfy the requirements of the site-specific assessment ordered by the District Court in 1974.

- What stocking levels and periods of use should be achieved on rangelands within the planning area, and where should management actions be prescribed to protect ecologically unique rangeland values?

WILDLIFE HABITAT MANAGEMENT

Big game species, aquatic species, special or sensitive species, and animals common to the region live within the planning area. Management of alternative uses of the public lands could affect habitats used by these animals. Within the planning area, certain wildlife habitats and riparian areas need to be managed to afford protection from adverse impacts caused by other land uses and extraction or production of natural resources.

- How should special wildlife habitat areas within the planning area be managed, and where should management actions be prescribed to alter or maintain present habitat areas?

WATERSHED MANAGEMENT

Management of watersheds within the planning area involves many different land uses. Surface disturbance, through mechanical means, grazing, or natural processes, can increase the potential for erosion. Compaction of sensitive soils can alter runoff rates from precipitation. Certain areas of badlands or gypsum soils significantly add to salinity and sedimentation of drainages leading to the Colorado River. Management actions within the planning area could lead to either an increase or a decrease in water quality.

Within the planning area, decisions are needed regarding management of watersheds and drainage basins. These decisions will, in turn, affect management of various uses of the public lands by determining where surface disturbance would be controlled, where enhancement of vegetation or water improvement projects would be allowed, and what reclamation measures would be required to safeguard fragile or hazardous areas.

- Which watersheds within the planning area should be managed, how, and where should management actions be prescribed to control surface-disturbing uses?

RECREATION MANAGEMENT

The planning area provides settings for many recreation opportunities, which vary based on the presence or absence of roads, facilities, cultural modifications, and visitors. Activities include both motorized and nonmotorized pursuits. The area is becoming more popular as it becomes better known, as evidenced by increasing visitation. However, some types of recreation uses are incompatible with one another or with other surface resource uses. Primitive recreation settings cannot be maintained if motorized recreation use occurs, and motorized settings can be altered with increased use. Some types of recreation opportunities are constrained or eliminated if surface resources are managed for an incompatible use.

Within the planning area, decisions are needed to determine the optimal mix of various recreation opportunities and the management actions needed to preserve such a mix. Management decisions to maintain, increase, or decrease the extent of recreation opportunities now present can affect other land uses, including resource production or extraction.

- Which recreation opportunities on the public lands should be maintained, increased, or limited, and where should management actions be prescribed to preserve this mix of opportunities?

WILDERNESS STUDY AREA MANAGEMENT

Seven wilderness study areas (WSAs) and one instant study area (ISA) lie within San Rafael Swell, and one WSA is adjacent to Labyrinth Canyon on the Green River. Within the planning area, 252,807 acres are under wilderness review (table 8 and map 10).

TABLE 8

Areas Under Wilderness Review

Study Area Number	Study Area Name	Acreage
ISA	Link Flats	912
UT-060-007	Muddy Creek	31,400
UT-060-023	Sids Mountain Complex	80,530
UT-060-025	Devils Canyon	9,610
UT-060-028A	Crack Canyon	25,315
UT-060-029A	San Rafael Reef	55,540
UT-060-045	Horseshoe Canyon	20,500
UT-060-054	Mexican Mountain	[a]29,000
TOTAL		252,807

[a] Excludes 30,600 acres in Price River Resource Area. The total acreage in Mexican Mountain WSA is 59,600.

Source: BLM, 1986.

In Utah, recommendations as to suitability or nonsuitability for wilderness designation of areas under wilderness review will be made through the statewide wilderness EIS [BLM, 1986]. Wilderness designations are made by Congress. Wilderness interim management policy (IMP) dictates management of these areas while under wilderness review, and the wilderness management policy describes how they will be managed if designated as wilderness by Congress. The San Rafael RMP/EIS will incorporate the area covered by WSAs as part of the planning area and will not develop management recommendations and strategies for specific areas within each WSA boundary.

MANAGEMENT CONCERNS

Some topics of general interest to both BLM and the public are not treated as planning issues because they do not meet the criteria given earlier. This does not imply that resolution of these management concerns is unimportant to effective management of the planning area. The following topics have been identified as specific management concerns for the San Rafael RMP/EIS.

WILD HORSE AND BURRO MANAGEMENT

The preplanning analysis also identified a sixth planning issue regarding management of small herds of wild, free-roaming horses and burros within the planning area. These animals are protected by law, and they compete with domestic livestock and wildlife species for the limited forage and water available. In some places, management of recreation or development of natural resource commodities on public lands limits the habitat once available for these animals. Significant controversy regarding management of these animals has arisen in other BLM districts.

The planning issue question was stated in the preplanning analysis as follows:

- How should wild, free-roaming horses and burros be managed within the planning area, and where should management actions be prescribed to alter or maintain present populations and habitat areas?

After due consideration, wild horses and burros were dropped from consideration as a planning issue for the following reasons.

- Although management of wild horses and burros is important in the national arena, management at the resource area level does not require the in-depth analysis of an EIS. The public has not expressed interest in management of these animals, and no conflicts regarding management of wild horses or burros have been identified.
- Wild horses and burros and related habitat concerns will be handled at the resource program level through the RMP, similar to any other program managed by BLM in the planning and grazing areas.
- Data regarding the current situation in the planning and grazing areas, particularly in regard to burros, are incomplete. Despite the law, horse populations have decreased from the 1971 level, but are now increasing. Burro population trends are unknown at this time. Because the present herds are small, water could be provided or habitat areas otherwise improved on a case-by-case basis through activity plans or project proposals. The broad level of management decisions made in an RMP are clearly not relevent to the limited number of animals present.

CULTURAL RESOURCE MANAGEMENT

Management of the archaeologic resource within the planning area has been identified as a concern by both BLM and the public. This is not treated as a planning issue, however, because under law, BLM must manage use of other resources to protect antiquities. The level of personnel required to enforce the law is an administrative concern, and specific management programs can be handled through activity plans after the RMP is issued.

MANAGEMENT OF GRAZING AND MINERALS ON OTHER FEDERAL LANDS

Management of grazing and mineral resources in Capitol Reef National Park (NP) and Glen Canyon National Recreation Area (NRA) is a topic of concern to both BLM and National Park Service (NPS). The management plan for Glen Canyon NRA [NPS, 1979] establishes zoning of grazing and minerals uses on NPS-administered land. BLM is required to manage these programs to conform with departmental direction. Specific grazing decisions will be treated through the livestock management issue. Management of minerals in NPS units falls under specific laws and regulations outside the discretion of the area manager.

MANAGEMENT OF MINERAL RESOURCES

The importance of minerals management in the planning area is reflected in public comments received on this topic. Management of most minerals, however, is governed strictly by law and ensuing departmental regulation, and is outside the discretion of the area manager; therefore, it does not meet the definition of a planning issue. The RMP will be used to apply stipulations or conditions to mineral-related activities and to weigh trade-offs between use of surface and subsurface resources. The RMP will also be used as a basis for coal unsuitability criteria analysis (43 CFR 3461) to determine if any areas are unsuitable for certain types of mining. The RMP, however, will not affect valid existing rights previously in place.

When oil and gas leases are issued, stipulations are attached to ensure protection of other resources, such as critical watersheds, where a conflict with minerals management may occur. Resources in need of protection and appropriate site-specific stipulations will be identified through the EIS. Oil and gas leasing categories will be applied according to the patterns of stipulations identified through the RMP.

MANAGEMENT OF OFF-ROAD VEHICLE USE

Management of off-road vehicle (ORV) use within the planning area is a continuing concern. By executive order or regulation, BLM is required to designate all public lands as open, closed, or limited for ORV use. These designations will come through the RMP and will apply to both recreational and nonrecreational ORV use.

SPECIAL MANAGEMENT DESIGNATIONS

Public interest has been expressed in designation of special management areas to recognize unique or significant ecological, geological, or scenic areas. In the past, BLM has recognized several types of special designations, such as outstanding natural areas and research natural areas, to protect specific values. Most special designations have now been merged with the area of critical environmental concern designation; exceptions include special recreation management areas and national historic landmarks. The potential for different types of special designations were assessed in the management situation analysis (MSA) for each resource management program. Most designations are made through the planning process, and impacts of these designations are assessed in the EIS.

WILD AND SCENIC RIVER DESIGNATIONS

Public interest has been expressed regarding the designation of wild and scenic river segments within the planning area. Two segments in SRRA were identified for study in the Nationwide Rivers Inventory (NRI) [NPS, 1982b]. The RMP/EIS will address the eligibility and potential classification of these study segments. Other river segments not on the NRI will also be assessed to see if they qualify for further consideration. BLM will make suitability recommendations on any segments studied after completion of the RMP/EIS. Designations to the National Wild and Scenic River System are made by Congress.

LAND CLASSIFICATIONS AND WITHDRAWALS

On February 10, 1986, Judge John H. Pratt issued a preliminary injunction order in the National Wildlife Federation v. Burford, et al. Civil Action No. 85-2238 (D.D.C. 1985). This injunction, effective February 15, 1986, enjoined BLM from

- modifying, terminating or revoking, in full or in part, under the Federal Land Policy and Management Act (FLPMA), any withdrawal or classification that was in effect on January 1, 1981, or

- taking any action inconsistent with the specific restrictions of a withdrawal or classification in effect on January 1, 1981, including, but not limited to, the issuance of leases; the sale, exchange, or disposal of land or interests in land; the granting of rights-of-way; or approval of any plan of operations.

Implementation of recommendations in the final RMP may be affected by the orders of the court.

PLANNING CRITERIA

Planning criteria (planning step 2) are guidelines established to (1) structure development of the RMP; (2) tailor the RMP to the planning issues; (3) avoid unnecessary data collection; (4) avoid unnecessary analyses; and (5) guide estimation of the effects of the various alternatives considered in the EIS.

The planning criteria guide agency and public review and explain what will be considered in the RMP/EIS. At various stages in the planning process, the criteria have different purposes. Therefore, separate criteria were developed to guide identification of problem areas in the MSA, formulation of alternatives, and estimation of the effects of alternatives.

Draft planning criteria (based on the preliminary planning criteria) were presented for a 30-day public review and comment period ending February 22, 1986. The draft planning criteria were modified to reflect public concerns and include suggestions received from the public. The criteria that guided identification of planning issues and collection of resource data are given in the appropriate parts of this section.

PLANNING CRITERIA FROM THE FEDERAL LAND POLICY AND MANAGEMENT ACT OF 1976

Section 202(c) of FLPMA provides that, in the development and revision of land use plans, the Secretary of the Interior shall:

(1) use and observe the principles of multiple use and sustained yield;

(2) use an interdisciplinary approach to integrate consideration of physical, biological, economic, and other sciences;

(3) give priority to the designation of areas of critical environmental concern;

(4) rely on the inventory of public lands, their resources, and other values;

(5) consider present and potential uses of the public lands;

(6) consider the relative scarcity of the values involved and the availability of alternative means and sites for realization of those values;

(7) weigh long-term benefits to the public against short-term benefits;

(8) provide for compliance with applicable pollution control laws; and

(9) to the extent possible, coordinate land use inventory, planning, and management of public lands with the land use planning and management programs of other federal agencies and state and local governments.

At Section 302(b), FLPMA requires the Secretary to manage the public lands so as to prevent unnecessary or undue degradation of the lands.

Because these fundamental planning criteria are required by law, they are not repeated below.

SPECIFIC SAN RAFAEL PLANNING CRITERIA

Criteria for Problem Identification

Current resource management practices discussed in the MSA will be identified as problem areas if any of the following conditions occurs:

- existing or proposed management of one resource significantly constrains or curtails existing or proposed use of another resource;
- agency guidance requires land use allocations, which are not now in place, to be made through the planning process;
- existing land use allocations conflict with current agency resource management policies or guidance;
- existing resource management practices conflict with management plans, policies, and guidance of another federal surface management agency; or if
- documented public controversy regarding management of a specific resource value indicates a management concern.

Criteria for Identification of Management Opportunities

The opportunity to change current management practices discussed in the MSA will be identified if any of the following conditions occurs:

- management problems identified under the above criteria can be resolved outside the EIS process through administrative means (these may be carried into the RMP);
- management problems identified under the above criteria can be resolved in alternative ways, with selection through the EIS process (the selected resolution will be carried into the RMP); or if
- current management does not now meet the above problem criteria, but could be improved or resource use enhanced through a change in management (these may be carried into the RMP).

Criteria for Alternative Formulation

The following criteria have been developed to guide formulation of a range of alternatives for each issue to be addressed in this draft EIS. Management problems that do not fall under the issues are resolved in the MSA and carried through the EIS analysis as management actions common to all alternatives.

All alternatives formulated and assessed in the draft EIS will:

- be in accordance with all applicable laws, regulations, and agency policies;
- provide reasonable, feasible, and practical guidance for management of the public lands and resources, without requiring appreciable changes in facilities, services, or scope of management; and
- provide a complete management plan for the entire planning area.

At least one of the alternatives assessed in the RMP/EIS will provide for each of the following:

- continuing the present management;
- maximizing the use, production or extraction of renewable and non-renewable resources, including grazing resources, mineral resources, and lands (although not necessarily within the same alternative);
- maximizing the development and use of the recreational resource, including motorized and nonmotorized pursuits (although not necessarily within the same alternative);
- minimizing consumptive use of the grazing resource by domestic livestock;
- recognition and protection of sensitive ecological or visual environments;
- designation and protection of areas of critical environmental concern or other special ecological areas (although not necessarily under only one alternative); and
- protection or enhancement of those values on public lands within the planning area which are relatively scarce within the public domain as a whole.

None of the alternatives assessed in the RMP/EIS will consider or provide for the following:

- the designation of public lands as wilderness (the assessment of effects of Congressional designation of wilderness is left to the statewide wilderness EIS);
- except as identified, the designation of specific parcels of public lands as suitable for disposal through sales, exchanges, state indemnity selections, or other means (these types of actions will be considered individually upon proper application; the RMP will be used as a guide to determine whether disposal would serve the national interest, and an RMP amendment will be prepared if necessary);
- the designation of specific parcels of public lands for special use permits, special withdrawals, private Congressional bills, or Congressional withdrawals, whether application is made by another federal agency or by other entities (these types of actions will be considered individually upon proper application; an RMP amendment will be prepared if necessary).

Criteria for Estimation of Effects

The estimation of effects of each alternative will include the following:

- the impact of management actions upon adjacent federal or private lands;
- the formal land use plans of state and local governments and other federal agencies;
- short-term impacts, or those occurring within 5 years of completion of a given management action (the period of time required for reclamation under normal conditions); long-term impacts, or those occurring thereafter; residual impacts, or those remaining 15 years after implementation of a management action; and cumulative impacts, or those which are individually insignificant but become significant when considered together;
- all local economic and social changes caused by each alternative, compared to the continuation of current management practices described in the no-action alternative; and
- the cost to the BLM of implementation, based on current conditions and budgets.

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CHAPTER 2, PLAN ALTERNATIVES

INTRODUCTION

Six alternative plans have been developed and analyzed to provide for multiple-use management of public lands in the planning area. This chapter describes those alternatives in detail and includes the standard operating procedures and special conditions (mitigation measures) that would be applied under each alternative. Mitigation was considered in the impact analysis (chapter 4). At the end of this chapter is a table that summarizes the environmental impacts of the alternatives.

DEVELOPMENT OF ALTERNATIVES

The alternatives were developed to provide different answers to the questions raised by the planning issues (chapter 1). They include solutions allowing for either production or protection of the many public resources found.

Each alternative provides a complete multiple use plan that could be used to guide management of all public lands and resources in the planning area. Each alternative plan could be implemented under existing laws, regulations, and policy, and within a reasonable tolerance of existing budgetary parameters. Therefore, each plan is believed to be reasonable and feasible, although each has a different focus. Each plan would be subject to all applicable laws, executive orders, and regulations, and to continuation of valid rights for use of public lands or resources existing at the time the resource management plan (RMP) becomes final.

The public was invited to provide ideas for consideration in the alternatives developed for the RMP. A public workshop was held in Huntington, Utah on November 18, 1987 to receive suggestions from the public. Those suggestions were considered during RMP preparation.

Alternative A (no action) represents continuation of present management as prescribed in the existing management framework plans (MFPs) and summarized in the management situation analysis (MSA). The interdisciplinary planning team developed alternatives B, C, D, and E to suggest different ways of managing the public lands and resources. Bureau of Land Management (BLM) managers selected ideas from these five alternatives to develop alternative F, the preferred alternative.

After developing goals for resolving the issues under the different alternatives, the interdisciplinary team looked at the resource management programs administered by BLM in the planning area to see what action would be necessary to work toward the goals. Each resource management program was analyzed in the MSA, which described current management under the MFPs, the capability of natural resources present to respond to demand, and management opportunities present. The objectives for existing management were written down for alternative A. Then objectives were developed for each of the other alternatives, to fit with the overall management goals.

Following the development of program management objectives for each alternative, the interdisciplinary team determined how these objectives could be met. Separate management actions were written for each resource management program to answer the questions or solve the problems that had been identified in the MSA. Some actions will

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remain constant under any alternative selected; these are described for each specific program and are followed by other actions that would vary according to the alternative discussed.

In developing the program management actions, the planning team reviewed the opportunities for designating areas of critical environmental concern (ACECs) identified for each program in the MSA. Nominations for ACECs made by members of the public or other agencies prior to preparation of this environmental impact statement (EIS) were considered along with preliminary identification of areas in the MSA (appendix B). Areas identified by the interdisciplinary team as having potential for ACEC designation were analyzed in at least one of the alternatives.

ALTERNATIVES ASSESSED

Each of the six alternatives presents guidance for all resource programs managed by BLM in the planning or grazing area. Except for alternative A, each plan presents generalized zones or levels of management (see the Summary). Decisions to protect or produce a given resource in that zone are applied to management of all resource programs. This ensures that requirements applied to an oil and gas operator, for example, correspond to the requirements applied to a rancher or recreationist.

Alternative A (the no-action alternative) represents continuation of current management and provides a baseline for comparing the other alternatives and anticipating the effects of their implementation.

Alternatives B through E were developed as various ways to answer the questions identified from the planning issues. For each planning issue, the team developed different answers to the question which would provide for more or less production or protection of the base resource at issue. This provides a range of management, from production to protection, for each resource found to be at issue.

Alternative F, the preferred alternative, was formulated by BLM managers based on the analyses of the other five alternatives. It incorporates actions from each of the other alternatives along with elements not found in any of the others.

Should the manager desire additions to the proposed plan, changes evaluated in the alternatives could be selected and presented in the proposed RMP and final EIS. The RMP eventually decided upon will recognize the concerns of the public and of other agencies regarding use of BLM-administered public lands and resources in the planning area.

GOALS AND PLANNING ISSUE RESOLUTIONS

For each of the six alternatives, the goals and the answers to the planning issue questions are as follows.

Alternative A (No Action)

Goal

The goal of alternative A is to continue the present level of management of public lands and resources.

Planning Issue Resolutions

Livestock Management. Maintain existing grazing allotments. Maintain existing allocation of forage (current animal unit months (AUMs)). Maintain present seasons of use.

Wildlife Management. Maintain existing allocations of forage for wildlife. Maintain current management of all wildlife habitat areas.

Watershed Management. Manage all watersheds to bring water quality into compliance with federal and state standards. Address surface runoff from specific projects on a case-by-case basis.

Recreation Management. Maintain current areas available for motorized and nonmotorized recreation use. Focus management on existing special recreation management areas (SRMAs).

Wilderness Study Area Management. Manage wilderness study areas (WSAs), if Congress releases them from further review without designating them as wilderness, under the existing MFPs.

Alternative B

Goal

The goals of alternative B are (1) to provide for the maximum amount of livestock grazing and minerals production over the greatest possible area, and (2) to make lands available for right-of-way corridors where conflicts with livestock grazing or mineral activities do not occur.

Planning Issue Resolutions

Livestock Management. Include all of the planning area within grazing allotments. Allow consumption of forage by livestock at the maximum level possible while providing for sustained yield of forage. Maximize seasons of use while providing for sustained yield of forage. Place special designations on areas of unique rangeland values for comparative studies. Conflicts between livestock and competing uses will be identified through the monitoring process and will be resolved at the activity plan level.

Wildlife Management. Allot forage for wildlife only where there are no conflicts with livestock grazing. Manage wildlife habitat to provide for maximum use by livestock; provide for wildlife only where there are no conflicts with livestock grazing or mineral activities.

Watershed Management. Manage watersheds to bring water quality into compliance with federal and state standards. Manage watershed conditions to improve water quality and decrease surface runoff where this would benefit livestock grazing. In other areas, address surface runoff from proposed actions on a case-by-case basis.

Recreation Management. Allow recreation use only so long as it does not conflict with livestock grazing, mineral activities, or utility corridor placement. Manage public lands for dispersed recreation use; do not provide special management to maintain specific recreation opportunities.

Wilderness Study Area Management. Manage WSAs, if Congress releases them from further review without designating them as wilderness, as follows: six under standard-surface-use stipulations and two as ACECs.

Alternative C

Goal

The goals of alternative C are (1) to maximize opportunities for nonmotorized recreation throughout the planning area, and (2) to manage wildlife habitat to allow wildlife populations to attain prior stable numbers.

Planning Issue Resolutions

Livestock Management. Provide grazing allotments for livestock only where conflicts with wildlife or primitive recreation values do not occur. Allow consumption of forage by livestock only where there is no conflict with wildlife or with primitive recreation values. Alter season of use to benefit wildlife and primitive recreation opportunities, or to provide for sustained yield of forage where no conflicts occur. Protect areas of unique rangeland values so long as wildlife habitat or primitive recreation opportunities would benefit. Conflicts between livestock and competing uses will be identified through the monitoring process and will be resolved at the activity plan level.

Wildlife Management. Increase acres of habitat available to wildlife. Manage special habitat areas to achieve Utah Division of Wildlife Resources (UDWR) prior stable numbers while providing for sustained yield of forage and browse.

Watershed Management. Manage watersheds to bring water quality into compliance with federal and state standards. Manage watershed conditions to improve water quality and decrease surface runoff in areas where wildlife habitat or primitive recreation opportunities would benefit. In other areas, address surface runoff from proposed actions on a case-by-case basis.

Recreation Management. Maximize areas available for nonmotorized recreation uses. Allow motorized recreation use only where it does not conflict with wildlife or nonmotorized recreation. Protect nonmotorized recreation opportunities.

Wilderness Study Area Management. Manage WSAs, if Congress releases them from further review without designating them as wilderness, as ACECs.

Alternative D

Goal

The goals of alternative D are (1) to provide for the maximum watershed condition within the planning area by minimizing surface disturbance to critical watershed areas, and (2) to provide the maximum protection of cultural resources. Critical watershed areas include soils that (1) have a high potential for salt yield, (2) are subject to severe water and wind erosion when disturbed, (3) have high runoff potential during storm events, (4) are subject to frequent flooding, or (5) have a potential for loss of vegetation productivity under high rates of wind or water erosion.

Planning Issue Resolutions

Livestock Management. Provide grazing allotments for livestock only where grazing would improve watershed condition and not conflict with cultural resource management. Allow consumption of forage by livestock to maximize watershed condition. Alter season of use to maximize watershed condition or to provide for sustained yield of forage where no conflicts occur. Protect areas of unique rangeland values where there is no conflict with watershed or cultural resource management. Conflicts between livestock and competing uses will be identified through the monitoring process and will be resolved at the activity plan level.

Wildlife Management. Allocate forage to wildlife to maximize watershed condition. Manage wildlife habitat to maximize watershed conditions.

Watershed Management. Manage watershed conditions to maximize water quality. Manage watershed conditions to minimize surface runoff.

Recreation Management. Allow recreation use only in areas where there is no conflict with watershed or cultural resource management. Do not provide management to maintain specific recreation opportunities.

Wilderness Study Area Management. Manage WSAs, if Congress releases them from further review without designating them as wilderness, as follows: six as ACECs and two as critical watershed areas.

Alternative E

Goal

The goal of alternative E is to maximize access and the opportunities for motorized recreation throughout the planning area.

Livestock Management. Maintain existing grazing allotments. Allow consumption of forage only where there is no conflict with motorized recreation use, while providing for sustained yield of forage. Change seasons of use to provide maximum opportunities for motorized recreation. Protect areas of unique rangeland values so long as there are no conflicts with motorized recreation use. Conflicts between livestock and competing uses will be identified through the monitoring process and will be resolved at the activity plan level.

Wildlife Management. Allocate forage to wildlife species where no conflicts occur with motorized recreation. Manage wildlife habitat where there are no conflicts with motorized recreation.

Watershed Management. Manage watersheds to bring water quality into compliance with federal and state standards. Manage watersheds to improve water quality where motorized recreation opportunities would benefit. Manage watershed conditions to decrease surface runoff so long as there are no conflicts with motorized recreation use. In other areas address surface runoff from proposed actions on a case-by-case basis.

Recreation Management. Maximize acreage available for motorized recreation. Protect motorized recreation opportunities and values associated with motorized recreation use.

Wilderness Study Area Management. Manage WSAs, if Congress releases them from further review without designating them as wilderness, as follows: three as ACECs, three for crucial bighorn sheep habitat, one for recreation opportunity spectrum (ROS) semiprimitive motorized (SPM) class, and one for standard surface use.

Alternative F (Preferred Alternative)

Goal

The goals of alternative F are to (1) provide for the protection of critical soils throughout the planning area and scenic resources within the San Rafael Swell; (2) protect crucial wildlife habitat; (3) provide special management for certain vegetation and cultural resource values; and (4) maintain existing livestock, wild horse and burro, and minerals uses where no conflict with the other listed goals would occur.

No-surface-occupancy stipulations may be waived in areas managed for scenic values if an environmental assessment (EA) concluded that the proposed action would not adversely impact scenic values. No such waivers would be considered in relict vegetation or recreation and public purpose (R&PP) lease areas.

"Critical soils" are either highly saline or highly susceptible to water erosion. "Certain vegetation values" are relict plant communities on Bowknot Bend and the Big Flat Tops and ecological values on The Wedge. "Certain cultural resource values" are those found in Dry Lake Archaeological District, Temple Mountain and Tomsich Butte Historical District, four pictograph sites, Copper Globe historic mine, and Swasey Cabin historic site.

Planning Issue Resolutions

Livestock Management. Maintain existing grazing allotments. Protect areas of unique rangeland values on Bowknot Bend and the Big Flat Tops. Modify forage allocations or seasons of use only where there is a conflict with critical soils and crucial wildlife habitat. Exclude grazing to protect pictographs, Swasey Cabin, and developed recreation sites. Conflicts between livestock and competing users will be identified through the monitoring process and will be resolved at the activity plan level.

Wildlife Management. Afford special protection to crucial wildlife habitat areas.

Watershed Management. Manage watersheds to bring water quality into compliance with federal and state standards. Manage watershed conditions to protect critical soils areas.

Recreation Management. Protect scenic and natural values and certain cultural resource values within the San Rafael Swell associated with recreation use. Manage for specific ROS classes in designated areas.

Wilderness Study Area Management. Manage WSAs, if Congress releases them from further review without designating them as wilderness, as follows: seven as ACECs and one for standard surface use.

ALTERNATIVES CONSIDERED BUT ELIMINATED

The planning team considered the following, but did not develop them into complete alternatives or subalternatives, for the reasons given.

The team discussed exclusion of grazing from all public lands in the grazing area, but did not consider this option under any alternative. Although a no-grazing alternative could have been used to provide one end of a spectrum of varying grazing intensities on public lands, it would not provide a reasonable form of management given the historic use of the area for grazing (over 100 years).

BLM is under no obligation to assess a no-grazing alternative in a grazing EIS where grazing has been a historic use and where this type of alternative would be infeasible and unreasonable (Natural Resources Defense Council Inc., et al. v. Hodel, 624 F.Supp. 1045 (D.Nev. 1985)).

Where grazing has already occurred, a no-grazing alternative does not present either an environmental baseline or a return to a previously ungrazed condition; instead, it presents a speculative analysis based on the abolition of an existing use.

Specific areas where grazing use conflicts with vegetation management, wildlife use, or recreation use have been identified, and the exclusion of grazing in these areas has been considered under one or more of the alternatives.

Some additional ACECs were recently nominated. These will be examined. If they meet the criteria and the BLM official desires, they could be nominated and plan amendments prepared which would establish them as ACECs.

LEGISLATIVE ACTIONS OR ACTIONS OF OTHER AGENCIES

Over the past few years, there has been discussion that some of the public lands in the planning area could be used for various projects that would involve legislation or management by another agency. These ideas have been presented to the public in the newspapers, on television, or in public meetings or hearings. No specific proposals have been made; therefore, such ideas were not considered in this document.

ALTERNATIVES

This section contains three major parts: (1) general administrative requirements; (2) standard operating procedures; and (3) program actions, including both actions common to all alternatives and actions specific to individual alternatives. The general administrative requirements and standard operating procedures apply to all alternatives.

Social and economic considerations are also part of every BLM management decision. Availability of funds influences the rate of program decision implementation (see table 9 and appendix C).

Applicable federal, state, and local laws, executive orders, regulations, and BLM policy statements are part of the management actions proposed under all alternatives. These are described in the MSA. Applicable laws are listed in appendix D.

GENERAL ADMINISTRATIVE REQUIREMENTS

The following general administrative requirements apply to all alternatives analyzed.

All of the alternatives are subject to the interim management policy (IMP) for areas under wilderness review. WSAs and the instant study area (ISA) were listed in chapter 1, table 8. The wilderness review process provides for BLM to determine whether an ISA or WSA is more suitable for wilderness designation or for other uses. Because wilderness suitability is being covered in the Utah statewide wilderness EIS [BLM, 1986], it will not be covered in the San Rafael RMP/EIS. The RMP/EIS, however, will be used to determine how the areas covered (ISAs and WSAs) in conjunction with adjacent public lands would be managed if released from wilderness review by Congress. Only Congress can designate an area as wilderness or release an ISA or WSA from BLM's wilderness review. The IMP will remain in effect until these areas are released from wilderness review. If an area is designated as wilderness, it will be managed in accordance with 43 CFR 8560. The special conditions developed in the RMP will also apply to these areas if they do not conflict with IMP or wilderness management regulations.

All of the alternatives recognize valid existing rights, including (1) rights of access to inheld private and state lands and (2) rights-of-way for county, state, or municipal roads. The management options presented are not intended to challenge or abridge those rights.

Leases, permits, grants, rights-of-way, and other authorizations issued prior to the final RMP will continue to be managed under the stipulations and special conditions in effect at the time they were issued. Those issued after completion of the final RMP will be subject to conditions imposed by the RMP, whether or not expressly stated.

TABLE 9

Comparison of Support Requirements Under the Alternatives

Subactivity/Resource Management Program	Alternative A ($1,000)	Alternative B ($1,000)	Alternative C ($1,000)	Alternative D ($1,000)	Alternative E ($1,000)	Alternative F ($1,000)
4111 Oil and Gas Leasing	108.9	119.8	108.9	27.4	108.9	108.9
4121 Coal Management	232.6	232.6	232.6	218.7	232.5	232.5
4131 Mineral Materials Management	15.0	15.0	15.0	3.7	15.0	15.0
4132 Mining Law Administration	33.0	36.3	41.3	66.1	49.5	49.5
4211 Rights-of Way	54.0	54.0	54.0	54.0	54.0	54.0
4212 Lands	40.3	40.3	40.3	40.3	40.3	40.3
4220 Withdrawal Processing and Review	0.4	0.4	10.1	19.9	10.1	2.9
4311 Forest Management	9.4	9.4	9.4	9.4	9.4	9.4
4321 Wild Horse and Burro Management	15.4	15.4	15.4	15.4	15.4	15.4
4322 Grazing Management	144.1	387.2	169.8	168.6	179.8	198.2
4331 Cultural Resource Management	16.0	21.2	44.0	40.0	44.0	44.0
4333 Recreation Management	57.9	36.3	78.2	59.0	77.0	77.8
4341 Soil, Water, and Air Management	96.1	120.4	166.4	166.4	120.4	211.4
4351 Habitat Management	43.7	36.5	160.5	115.8	62.4	121.3
4352 Endangered Species Management	26.4	26.4	43.3	33.3	33.3	36.5
4410 Planning	47.0	54.4	55.3	50.0	54.1	57.7
4420 Data Management	1.0	1.2	1.2	1.0	1.2	1.3
4610 Presuppression	2.7	2.7	2.7	2.7	2.7	2.7
4620 Firefighting	1.0	1.0	1.0	1.0	1.0	1.0
4711 Building Maintenance	39.9	46.3	47.0	42.6	46.0	49.1
4712 Recreation Maintenance	10.0	10.0	14.9	10.0	14.9	14.9
4714 Engineering Services	2.3	2.6	2.7	1.1	2.6	2.7
4820 Equal Employment Opportunity	1.4	1.6	1.6	1.5	1.6	1.7
4830 Support Services	105.4	120.8	122.6	111.0	119.8	128.0
8100 Range Improvements	0.9	88.0	0	0	0.9	25.0
TOTAL	1,105.9	1,443.5	1,438.2	1,258.9	1,297.8	1,501.2

Applications pending approval at the time this RMP/EIS is prepared will be subject to plan conditions in place at the time they are approved.

Implementation of the proposed management actions will be guided by activity plans such as habitat management plans (HMPs), allotment management plans (AMPs), watershed plans or cultural resource management plans. Site-specific management plans will also be prepared for SRMAs and designated ACECs. These activity-level plans prescribe detailed management actions needed to accomplish RMP goals and objectives. Selected areas may be blocked together for improved management. Site-specific impacts of these actions will be assessed through National Environmental Policy Act (NEPA) documents prepared concurrently with the activity plans unless a sufficient document has already occurred in this or other EISs. Those site-specific environmental assessments (EAs) and findings of no significant impacts would tie to this RMP/EIS.

Small-scale projects and uses not specifically discussed in this RMP/EIS, such as minor rights-of-way, access roads, and free use or land use permits, will be allowed if they conform to the management prescriptions authorized under the plan.

Routine processing of applications, notices, and permits, and preparation of NEPA documents, appraisals, reserve calculations, and other paperwork will continue. These actions will be subject to plan conditions in place at the time they are approved.

BLM will continue to conduct routine compliance checks, inspections, and enforcement actions to ensure that leases, grants, and other activities are being operated or conducted in accordance with the terms and conditions of the authorizing documents. BLM will also continue to act to prevent unnecessary or undue degradation of public lands.

Ongoing inventory and data collection needed to support BLM's resource management programs will continue. Inventory work will be conducted as funding and personnel are available. This type of data development and review may result in designation of such special areas as lease tracts, SRMAs, National Register sites, and similar types of designations that depend on field data rather than on plan decisions.

Should any unforeseen proposal occur that is in conflict with, or does not conform to, the decisions made in this RMP, action may be initiated to revise, update, or modify this plan before the proposal will be implemented.

STANDARD OPERATING PROCEDURES

The following procedures are mitigation measures currently applied to development activities and other uses in the planning area. They are considered to be a part of all alternatives unless specifically superseded by the special conditions developed for the six alternatives, given later in this chapter.

Standard operating procedures were taken into account during the impact analysis (chapter 4). They are arranged in order of the resource value protected (mitigated).

Soils

Mitigation measures are placed on all surface-disturbing actions to protect watersheds and prevent offsite sedimentation and salinity within surface watercourses. Operations or facilities will be located so as to reduce erosion and improve the opportunity for revegetation.

In order to minimize watershed damage during wet or muddy periods, BLM may prohibit access, grading, exploration, drilling, development, or other activity. BLM may limit cross-country travel or construction activity to times when soils are dry or frozen or have snow cover. BLM will determine what is "wet," "muddy" or "frozen" based on weather and field conditions at the time. The limitation does not apply to maintenance and operation of producing wells or mines.

During project construction, surface disturbance and vehicle travel will be limited to the approved location and approved access routes. Any additional area needed must be approved by BLM prior to use.

Water bars will be constructed on road grades or slopes, if required by BLM.

Reserve pits for mining or oil and gas drilling operations may be required to be lined with commercial-grade bentonite or plastic liners sufficient to prevent seepage. At least half of the capacity will be in a cut.

No oil, lubricants, or toxic substances may be drained onto the ground surface.

Construction and development are to be avoided where possible in areas with the following characteristics: slopes in excess of 10 percent, soils high in clay content, and soils high in salt or gypsum content; these areas are subject to erosion and difficult to revegetate. BLM will determine whether soils within a project area meet these criteria.

New roads will be constructed so as to avoid these areas where possible. Where roads must be allowed, new roads will be graded to spread drainage instead of channeling runoff. No road grades in excess of 15 percent will be allowed; no surface disturbance from vehicle chains or leads will be allowed on slopes greater than 15 percent. No vehicle access will be allowed across slopes in excess of 25 percent.

Vegetation manipulation techniques on slopes greater than 10 percent will be limited to chemical treatments and broadcast seedings; chainings, railings, or other surface-disturbing methods will not be allowed.

Water

Existing fords will be used for drainage crossings where possible. Low-water crossings will use a cut-and-fill process or upgrade existing crossings unless use of culverts is specifically authorized.

Bridges and culverts will allow adequate fish passage where applicable. Take-down (or free-floating) panels or water gates will be installed on all fences that cross intermittent or perennial stream channels.

Drill holes will be sealed, plugged, and capped in accordance with BLM and state standards.

No vibroseis, drilling, or blasting will be allowed within 0.2[illegible] mile of any spring or water well. Powder magazines will be located at least 0.25 mile from regularly traveled roads and out of sight from the roads.

For construction projects lasting more than 30 days and for recreation events, portable chemical toilets will be provided at all staging areas, bases of operations, and storage areas.

Soaps, detergents, or other nondegradable foreign substances will not be used for washing in streams or rivers; biodegradable soap may be used.

Prior to the use of insecticides, herbicides, fungicides, rodenticides, and other similar substances, an operator must obtain from BLM approval of a written plan. The plan must describe the type and quantity of material to be used, the pest to be controlled, the method of application, the location for storage and disposal of containers, and other information that BLM may require. A pesticide may be used only in accordance with its registered uses and within other agency limitations. Pesticides must not be permanently stored on public lands.

If facilities authorized for construction use polychlorinated biphenyls (PCBs), such use must be in a totally enclosed manner in accordance with provisions of 40 CFR Part 761. Additionally, any release of PCBs (leaks, spills, etc.) in excess of the reportable quantity must be reported as required by 40 CFR Part 117.

Vegetation

Vegetation removal necessitated by a construction project will be confined to the limits of actual construction. Removed vegetation will be burned, stockpiled for use in reclamation, or removed from the construction site at the direction of BLM.

Reclamation will start immediately upon completion of the project, unless prevented by weather conditions. Disturbed areas will be restored to approximately the original contour.

The stockpiled topsoil will be spread evenly over the recontoured area. All disturbed areas and vehicle tracks from overland access will be ripped 4 to 12 inches deep with the contour.

Reseeding will be done from October 1 to November 15 and from February 1 to March 30. The seed mix will be prescribed by BLM. The area will be reseeded with a mixture of native and exotic species tailored to a specific ecological site (not a standard seed mixture). An adventive species may be included as a nurse crop or as a ground cover to control erosion, when approved in advance by BLM.

Seed may be drilled or broadcast, as approved by BLM. Where broadcast seeding is used, seeding will take place after the soil surface is recontoured and scarified. A harrow or similar implement will be dragged over the area to assure seed cover.

On all cut slopes, the seeding must extend from the bottom of the ditch to the top of the cut slope. On embankment slopes, the seeding must extend from the roadway shoulder to the toe of the slope. Seeding will also be done on all borrow pit areas and on all sidecast slopes in areas of full bench construction.

BLM may require a reclamation bond. Revegetation must be successfully established within 5 years after project completion for release of the bond.

Woodland products may be harvested only in designated areas. During fire-closure periods, woodcutters using a chain saw will carry shovels and attempt to prevent or control any fire that may result from their cutting operation.

During other types of activities, living trees must not be cut or otherwise damaged unless authorized by BLM.

Precautions must be taken at all times to prevent wildfire. Public land users will be held responsible for suppression costs for any fires on public lands caused through negligence. No burning of debris will be allowed without specific authorization from BLM.

For cooking, the use of small campstoves is recommended. Campfires must be kept to a minimum size and utilize only downed dead wood.

Wild Horses and Burros

No water source in a wild horse or burro area will be fenced or otherwise made inaccessible to wild horses or burros, except guzzlers constructed for wildlife.

No established wild horse or burro trail will be fenced, nor will any barricade be established that would restrict wild horse or burro movement along that trail, without authorization from BLM.

Livestock Grazing

Range management facilities, such as fences, wells, reservoirs, and other improvements, must not be disturbed without prior approval of BLM. Where disturbance is necessary, the operator will return the facility to its original condition.

Newly constructed range improvements such as fences and reservoirs must meet BLM standards. When it is necessary to gain access across a fenceline for construction purposes, the fence must be braced. Four-inch timber or equivalent must be installed and the gateway kept closed when not in actual use. All gates found closed during the course of the operation must be reclosed after each passage of equipment and crew members. A cattleguard may be required on main travel routes.

If road construction cuts through natural topography that serves as a livestock barrier, a fence must be constructed.

Drilling pits will be fenced upon completion of drilling operations, unless the pit is immediately filled in.

Cultural Resources

All areas subject to surface disturbance or rehabilitation that have not been previously inventoried for cultural resources must be inventoried prior to starting the activity. Both direct and indirect damage will be avoided to the extent possible without curtailing valid rights.

Cultural resources will be evaluated under existing federal laws and regulations. Consultation with the Utah State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation will occur wherever mandated.

Surface disturbance will be allowed only after cultural resource management objectives are met. All sites will be avoided or mitigated in keeping with the specific management objectives assigned. Disturbance to or loss of any cultural property to the extent that the specific cultural resource management objective cannot be met is considered to be unnecessary and undue degradation and will not be allowed, regardless of the causal activity.

The following special management conditions are needed to achieve cultural resource management objectives:

- All sites managed for conservation must be avoided and protected from natural and human-caused deterioration. They are closed to conflicting uses. They remain under protective management until all similar sites not managed for conservation are used and technology used in archaeology has developed to such a state that their use would make a major contribution to archaeological study of the area.

- Sites managed for public values must first have their information potential recovered through appropriate study guided by an approved research design, in order to mitigate the impacts of visitor use and to provide information for interpretation.

- All other sites are managed for their information potential; they must be avoided until their potential is collected through appropriate study guided by an approved research design.

Visual Resources

BLM may require semipermanent and permanent facilities to be painted to blend with the natural surroundings.

Road construction must meet BLM class III standards, which may be reviewed at BLM resource area or district offices.

With BLM approval, existing roads or trails may be improved (bladed) if impassable by vehicles or equipment. No widening or realignment will be allowed unless approved by BLM. Existing trails may have to be reclaimed or brought back to original conditions.

New trails may be constructed only when vehicle and equipment passage is impossible, and only with the concurrence of BLM. There will be no straight line-of-sight bulldozing; any path dozed through a timbered area will take a zig-zag path. Any pushed trees are to be readily retrievable without additional disturbance, if needed for reclamation.

Upon completion of the project, the area and access routes will be reclaimed to as near the original condition as possible.

All disturbed areas will be recontoured to blend as nearly as possible with the natural topography. All berms will be removed and all cuts (including roads) filled.

Drill hole cuttings will be placed down the hole, and any remaining cuttings will be buried at the drill hole location.

Construction areas and access roads will be kept litter-free. The operator must provide a trash pit or trash cage. If a trash pit is used it will be dug at least 6 feet into solid undisturbed material near the project. It will be totally enclosed with a fine wire mesh prior to construction operations. Immediately on completion of a construction project, all trash and debris will be collected from the location and surrounding area, placed in the trash pit, compacted, and buried under at least 2 feet of compacted soil.

For other types of activities, such as recreation events, trash will be collected and contained during the operation. All garbage, trash, flagging, lath, etc. will be removed from the area and hauled to an authorized dump site.

Wildlife

Known raptor nest sites in both San Rafael Resource Area (SRRA) and forest planning unit (FPU) will be protected. Permitted activities within 0.5 mile of active nest sites (these have not been mapped and may vary in location from year to year) will be restricted during the nesting season (February 15 to June 15 annually).

Endangered Species

All surface-disturbing activities, including recreation events, will require a clearance to ensure protection of threatened or endangered (T/E) species.

T/E species will be managed in accordance with the Endangered Species Act and all other applicable laws and policies. Under the Endangered Species Act, the habitat of a T/E plant species cannot be disturbed unless the species would benefit from the disturbance; departmental regulations and policy extend this requirement to candidate and sensitive species also. Activities or projects involving surface disturbance will be checked to ensure adequate protection for these species.

Fire

All wildfires endangering life or property will be suppressed. Where resource conditions warrant, a fire rehabilitation plan will be developed and implemented, using native or exotic species.

RESOURCE MANAGEMENT PROGRAM ACTIONS

This section describes suggested actions under BLM resource management programs. Special management designations considered under each alternative are listed in table 10 and shown on maps 11, 12, 13, 14, 15, and 16. Some of the ACECs coincide with areas now (1988) under wilderness review. If Congress later designates such areas as wilderness, the ACEC designation could be dropped if wilderness management adequately protects the values for which the ACEC was established. Appendix B presents the rationale for ACEC nominations.

The management prescriptions developed for the nominated ACECs and other special areas under the various alternatives are presented in this chapter. Maps 1, 2, 3, 4 and 5 summarize the management prescriptions. Appendix B also contains a discussion of areas considered by the interdisciplinary team but not nominated for ACEC designation. Should any of these or other nominations for ACECs be made at a later date, an EA and plan amendment would be prepared.

Each resource management program section begins with actions common to all alternatives, followed by a discussion of special management designations under that program and a summary display of actions that would occur under each alternative for that program. Special management areas would be considered open unless otherwise designated. Where that display shows ACEC designation, the special conditions for its management under the alternatives are also listed.

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TABLE 10

Nominated Area of Critical Environmental Concern Designations, by Alternative (acres)

Administering Program	Area Name	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
		Acres by Alternative					
4322	Bowknot Bend	0	1,830	1,830	1,830	1,830	1,830
	Hebes Mountain	0	0	0	960	0	0
	North Big Flat Top[a]	0	190	190	190	190	0
	Big Flat Tops	0	0	0	0	0	2,640
4322, 4333	San Rafael Reef	0	43,870	67,520	43,870	0	68,720
4331	Copper Globe[b]	0	0	0	0	0	220
	Dry Lake Archaeological District	0	0	16,990	16,990	16,990	16,990
	I-70 Pictographs[c]	0	30	(30)	0	(30)	0
	Pictographs[d]	0	0	0	40	0	40
	Little Black Mountain	0	0	0	2,160	0	0
	Swasey Cabin	0	0	0	220	0	220
	Temple Mountain Historical District	0	0	2,660	2,660	2,660	2,660
	Tomsich Butte Historical District[d]	0	0	2,040	2,040	2,040	(2,040)
4333	Gilson Buttes	0	0	1,750	1,750	0	0
	I-70 Scenic Corridor	52,150 (SRRA 49,450) (FPU 2,700)	0	52,150 (SRRA 49,450) (FPU 2,700)	52,130 (SRRA 49,430) (FPU 2,700)	52,150 (SRRA 49,450) (FPU 2,700)	52,130 (SRRA 49,430) (FPU 2,700)
	Muddy Creek	0	0	46,720	22,540	22,540	24,540
	San Rafael Canyon	0	0	58,510	58,510	58,510	35,240
	Segers Hole	0	0	7,120	7,120	0	7,120
	Sids Mountain	0	0	89,060	89,060	0	61,870
		52,150	45,920	322,360	302,070	156,910	274,260

NOTE: All acreages are approximate and rounded to the nearest 10 acres. All acreages pertain to SRRA unless otherwise noted. Rationale for ACEC nominations and acreages appear in appendix B.

[a] Under alternative F, the area name changes to Big Flat Tops.

[b] Under alternatives C and D, the Copper Globe area is part of the Sids Mountain ACEC.

[c] Under alternatives C and E, the I-70 Pictographs ACEC would be included as a special emphasis area within the I-70 Scenic Corridor.

[c] Under alternatives D and F, the Pictographs ACEC would include both the I-70 and Rochester pictograph sites.

[d] Under alternative F, the Tomsich Butte Historic District would be included as a special emphasis area within the Muddy Creek ACEC.

4111 OIL AND GAS MANAGEMENT

Management Common to All Alternatives

Oil and gas resources are allocated through leasing. The San Rafael Special Tar Sand Area (STSA) within SRRA is available for tar sand or oil and gas development only through combined hydrocarbon leases (CHLs). Other areas are available through regular leases. Oil and gas leases are issued by BLM's Utah State Office (USO).

Public lands within the planning area were categorized for oil and gas leasing through a programmatic EA in 1975 [BLM, 1975] and the statewide tar sand EIS in 1984 [BLM, 1984c]. Appendix E describes the categories that establish special leasing conditions for CHLs and oil and gas leases. The resource area and district office administer compliance with lease terms. The leasing categories as currently applied are shown on map 17.

CHLs are issued by BLM's USO under competitive lease. All regular leases are offered first competitively, then over the counter.

Areas under wilderness review (WSAs and ISAs) are not available for lease. These areas are managed under IMP. If and when the areas are released from wilderness review, the category special conditions developed in the RMP will apply. Areas designated as wilderness will not be available for lease. Should Congress designate all or part of the WSA or ISA as wilderness, that action will constitute an amendment to the RMP.

Some federal oil and gas resources underlie lands in the planning area not administered by BLM. (There are no split-estate lands within the STSA.) The surface owner or administering federal agency manages the surface, and BLM administers the operational aspects of these leases with concurrence of the surface owner or administering agency where such use is authorized. Under the Federal Onshore Oil and Gas Leasing Reform Act of 1987, national forest lands are leased for oil and gas only with consent of the U.S. Forest Service (USFS).

BLM will not categorize split-estate lands. Geophysical exploration permits for oil and gas may be issued in areas not under lease or not available for lease, if the terms and conditions of the RMP and other applicable policies (such as IMP) are met (appendix E).

Management Under the Alternatives

BLM policy requires that the least-limiting level of restriction be applied to oil and gas leases (76 IBLA 395 (1983)). Accordingly, the nature and extent of an actual or potential conflict must be determined, and the area must be placed under the least restrictive category that would serve to mitigate the conflict.

The following display summarizes oil and gas management actions that would occur under the six alternatives.

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
	Maintain existing oil and gas and tar sand leasing category applications.	Apply oil and gas and tar sand leasing categories to open all area to lease development.	Apply oil and gas and tar sand leasing categories to protect nonmotorized recreation opportunities and wildlife habitat.	Apply oil and gas and tar sand leasing categories to protect watershed and cultural resources.	Apply oil and gas and tar sand leasing categories to protect motorized recreation opportunities.	Apply oil and gas and tar sand leasing categories to protect certain wildlife habitats, cultural ACECs, watershed resources, and scenic and vegetation ACECs.
Category 1 acres[a]						
SRRA	1,130,280	1,416,050	181,450	168,510	442,730	710,920
FPU	51,770	75,350	12,260	3,820	29,080	50,850
Total	1,182,050	1,491,400	193,710	172,330	471,810	761,770
Category 2 acres[b]						
SRRA	43,130	45,730	784,020	77,990	864,990	505,430
FPU	18,270	0	58,270	7,600	43,570	21,210
Total	61,400	45,730	842,290	85,590	908,560	526,640
Category 3 acres[c]						
SRRA	169,320	0	28,250	0	154,210	242,520
FPU	5,310	0	2,120	0	2,700	3,290
Total	174,630	0	30,370	0	156,910	245,810
Category 4 acres[d]						
SRRA	121,110	2,060	470,120	1,217,340	1,910	4,970
FPU	0	0	2,700	63,930	0	0
Total	121,110	2,060	472,820	1,281,270	1,910	4,970

[a] Category 1 is the same as standard surface use.

[b] Category 2 is the same as special condition surface use.

[c] Category 3 is the same as no surface occupancy.

[d] Category 4 is the same as no permit or lease.

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4113 GEOTHERMAL MANAGEMENT

Management Common to All Alternatives

Geothermal leases are noncompetitive and will be issued by USO. Areas under wilderness review will not be available for leasing.

No interest has been expressed in geothermal leasing. If and when interest is expressed in geothermal exploration or leasing, the special conditions developed in the RMP for oil and gas leasing will be applied. If these do not prove satisfactory, the RMP will be amended to establish leasing conditions and exploration requirements.

Geothermal exploration and leasing applications would be processed on a case-by-case basis under all six alternatives.

4121 COAL MANAGEMENT

Management Common to All Alternatives

The planning area contains two known recoverable coal resource areas (KRCRAs): Wasatch and Emery (map 18). The KRCRAs are the only parts of the planning area that have potential for coal resource development. At the start of this planning effort, the KRCRAs were analyzed for their suitability for leasing according to the unsuitability criteria in 43 CFR 3461. The unsuitability study (appendix F) was conducted only within the two KRCRAs, which underlie public lands managed by BLM. Areas identified as suitable for coal leasing are shown on map 19.

The unsuitability criteria may restrict all or certain types of mining techniques. New lease applications will be processed only in areas found suitable for leasing in the coal unsuitability analysis.

The resource area will recommend areas within the KRCRAs to USO for leasing. Coal leases issued subsequent to the RMP will be subject to both the unsuitability criteria and the special conditions developed in the RMP. No coal will be leased outside the KRCRAs.

After a lease is issued, a mining permit application package required by the Surface Mining Control and Reclamation Act is approved. The authorized officer would have to give concurrence for approval to the regulatory agency and would incorporate into the mining permit any special conditions developed in the RMP/EIS. The authorized officer would also approve mining plans for coal recovery.

Some federal coal resources within the planning area underlie nonfederal surface or federal lands administered by USFS. USFS or the surface owner manages the surface, and BLM administers the operational aspects of these resources when leased, with concurrence of USFS or the surface owner where such use is authorized. RMP special conditions do not apply to these lands.

Management Under the Alternatives

With differing levels of emphasis on protection of other resources, the acreage available for coal exploration and lease would vary by alternative.

The following display summarizes coal management actions that would occur in the KRCRAs under the six alternatives.

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	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
	Continue to allow coal exploration.	Manage coal exploration with the least possible of surface operations.	Manage coal exploration to protect nonmotorized recreation opportunities and wildlife habitat.	Manage coal exploration to protect watershed and cultural resources.	Manage coal exploration to protect motorized recreation opportunities.	Manage areas for coal exploration to protect certain wildlife habitats, cultural ACECs, watershed resources, and visual and grazing ACECs.
Acres available						
SRRA	33,720	33,720	32,440	15,930	33,720	33,710
FPU	28,570	28,570	25,870	2,540	28,570	28,570
Total	62,290	62,290	58,310	18,470	62,290	62,280
Standard conditions						
SRRA	32,280	33,560	11,900	15,550	27,080	23,120
FPU	25,870	28,570	7,580	2,540	17,550	13,070
Total	58,150	62,130	19,480	18,090	44,630	36,190
Special conditions						
SRRA	160	160	20,330	380	5,360	9,320
FPU	0	0	18,220	0	8,320	12,800
Total	160	160	38,550	380	13,680	22,120
No surface disturbance						
SRRA	1,280	0	210	0	1,280	1,280
FPU	2,700	0	70	0	2,700	2,700
Total	3,980	0	280	0	3,980	3,980

(Continued)

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
	Allow coal leasing, development, and mining on areas determined suitable for leasing.	Manage coal leasing, development, and mining on areas determined suitable for leasing.	Manage coal leasing, development, and mining to protect non-motorized recreation opportunities and wildlife habitat.	Manage coal leasing, development, and mining to protect watershed and cultural resources.	Manage coal leasing, development, and mining to protect motorized recreation opportunities.	Manage coal leasing, development, and mining to protect certain wildlife habitats, cultural ACECs, watershed resources, and scenic and vegetation ACECs.
Acres available						
SRRA	29,620	29,620	28,340	11,830	29,620	29,610
FPU	28,570	28,570	25,870	2,540	28,570	28,570
Total	58,190	58,190	54,210	14,370	58,190	58,180
Standard conditions						
SRRA	28,340	29,620	7,800	11,450	22,980	19,010
FPU	25,870	28,570	7,580	2,540	17,550	13,070
Total	54,210	58,190	15,380	13,990	40,530	32,080
Special conditions						
SRRA	0	0	20,330	380	5,360	9,320
FPU	0	0	18,220	0	8,320	12,800
Total	0	0	38,550	380	13,680	22,120
No surface disturbance						
SRRA	1,280	0	210	0	1,280	1,280
FPU	2,700	0	70	0	2,700	2,700
Total	3,980	0	280	0	3,980	3,980

4131 MINERAL MATERIALS MANAGEMENT

Management Common to All Alternatives

Disposal of mineral materials is by sale at fair market value or by free use permit for public agencies. Disposal sites are established in response to specific requests. Sales and free use permits (map 20) are handled at the resource area office.

All existing material sites (map 21) will remain open until the end of their term and then be evaluated. All community pits (map 22) will remain open until available material is exhausted and then be closed.

Free use of petrified wood (up to 250 pounds per person per year) is allowed for noncommercial purposes on all public lands unless otherwise provided through notice in the *Federal Register*. No part of the planning area will be designated as closed to petrified wood collecting.

Management Under the Alternatives

The RMP will be used to determine which areas are available for mineral materials use and to impose conditions that will apply to use of material sites.

The following display summarizes mineral material management actions that would occur under the six alternatives.

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	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
	Manage mineral material disposals on a case-by-case basis.	Manage mineral material disposals on a case-by-case basis.	Manage mineral material disposals to protect nonmotorized recreation opportunities and wildlife habitat.	Manage mineral material disposals to protect watershed and cultural resources.	Manage mineral material disposals to protect motorized recreation opportunities.	Manage mineral material disposals to protect scenic, cultural, and vegetation ACECs.
Acres available						
SRRA	1,463,840	1,461,780	961,620	246,500	1,307,720	1,216,350
FPU	75,350	75,350	70,530	11,420	72,650	72,060
Total	1,539,190	1,537,130	1,032,150	257,920	1,380,370	1,288,410
Standard conditions						
SRRA	1,369,480	1,416,050	177,600	168,510	442,530	710,920
FPU	51,770	75,350	12,260	3,820	29,080	50,850
Total	1,421,250	1,491,500	189,860	172,330	471,610	761,770
Special conditions						
SRRA	94,360	45,730	784,020	77,990	865,190	505,430
FPU	23,580	0	58,270	7,600	43,570	21,210
Total	117,940	45,730	842,290	85,590	908,760	526,640
No disposal						
SRRA	0	2,060	502,220	1,217,340	156,120	247,490
FPU	0	0	4,820	63,930	2,700	3,290
Total	0	2,060	507,040	1,281,270	158,820	250,780

4132 MINING LAW ADMINISTRATION

Management Common to All Alternatives

Locatable minerals are administered under the mining laws, which preserve the rights of individuals and corporations to enter on the public lands to claim (locate) certain types of mineral discoveries. All public domain lands overlying federal minerals are open to mining claim location unless specifically withdrawn from mineral entry, either (1) by secretarial order or public law or (2) under specific reservations, such as an R&PP lease. Lands and minerals that were acquired by the federal government but were not part of the original public domain are not open to mineral entry under the mining laws. Lands not open to mineral entry are shown on map 23.

BLM administers claim recordation requirements (at USO) and operational aspects of mining federally owned minerals (at the resource area office), whether or not BLM administers the surface.

BLM will continue to conduct mining claim validity and patent examinations. Validity examinations determine if a mining claim is valid, and patent examinations determine if the requirements have been met for a claim to go to patent. Patented claims are owned and administered by the holder of the patent; RMP conditions do not apply to patented claims.

The RMP does not impose conditions on work done under a notice of intent, but does provide special conditions to apply to operations approved under a plan of operations, regardless of whether the claim is located before or after the RMP is adopted. Plans of operation are required for operations that would disturb more than 5 acres and for any operation except casual use in (1) areas designated for potential addition to, or designated as part of, the National Wild and Scenic Rivers System; (2) designated ACECs; (3) designated wilderness areas; and (4) areas designated as closed to off-road vehicle (ORV) use (43 CFR 3809).

The BLM may identify lands to be withdrawn from mineral entry, but cannot withdraw these lands. BLM must file an application for secretarial withdrawal. Lands would become segregated from entry for 2 years upon BLM's filing for withdrawal. If the Secretary orders a withdrawal, the segregation ceases. (Congressional approval is required for all withdrawals of 5,000 acres or more.) If the Secretary disagrees with BLM's recommendation, the segregation can be released. If the Secretary fails to act, the segregation expires after 2 years. These actions do not affect the validity of claims located on these areas prior to segregation or withdrawal.

For previously located claims in segregated areas, work done under a plan of operations will be approved with special conditions to protect the resource value for which the segregation was made.

Management Under the Alternatives

With differing levels of emphasis on protection of other resources, the acreage open to mineral entry would vary by alternative.

The following display summarizes locatable mineral management actions that would occur under the six alternatives.

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
	Maintain the present area open to mining claim location.	Maintain the present area open to mining claim location.	Manage the area open to mining claim location to protect nonmotorized recreation opportunities and wildlife habitat.	Manage the area open to mining claim location to protect watershed and cultural resources.	Manage the area open to mining claim location to protect motorized recreation opportunities.	Manage the area open to mining claim location to protect the I-70 Pictographs and Swasey Cabin ACECs.
Administer mining claim location						
SRRA	1,463,840	1,463,840	1,463,840	1,463,840	1,463,840	1,463,840
FPU	75,350	75,350	75,350	75,350	75,350	75,350
Total	1,539,190	1,539,190	1,539,190	1,539,190	1,539,190	1,539,190
Not open to entry						
SRRA	1,780	3,840	471,900	1,218,140	3,690	6,750
FPU	0	0	2,700	63,930	0	0
Total	1,780	3,840	474,600	1,282,070	3,690	6,750
Open to entry						
SRRA	1,462,060	1,460,000	991,940	245,700	1,460,150	1,457,090
FPU	75,350	75,350	72,650	11,420	75,350	75,350
Total	1,537,410	1,535,350	1,064,590	257,120	1,535,500	1,532,440
Standard conditions						
SRRA	1,412,610	1,416,050	377,140	245,700	1,305,940	1,190,590
FPU	75,350	75,350	55,480	11,420	72,650	72,650
Total	1,487,960	1,491,400	432,620	257,120	1,378,590	1,263,240
Special conditions						
SRRA	49,450	43,950	614,800	0	154,210	266,500
FPU	0	0	17,170	0	2,700	2,700
Total	49,450	43,950	631,970	0	156,910	269,200

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Manage mineral exploration and mining operations on a case-by-case basis. Approve mining plans in areas open to entry.	Manage mineral exploration and mining operations to protect vegetation ACECs. Approve mining plans in areas open to entry.	Manage mineral exploration and mining operations to protect nonmotorized recreation opportunities and wildlife habitat. Approve mining plans in areas open to entry.	Manage mineral exploration and mining operations on a case-by-case basis. Approve mining plans in areas open to entry.	Manage mineral exploration and mining operations to protect motorized recreation opportunities. Approve mining plans in areas open to entry.	Manage mineral exploration and mining operations to protect watershed resources and scenic, cultural, and vegetation ACECs. Approve mining plans in areas open to entry.
Open to entry acres	Open to entry acres	Open to entry acres	Open to entry acres	Open to entry acres	Open to entry acres
1,537,410	1,535,350	1,064,590	257,120	1,535,500	1,532,440

4133 LEASABLE MINERALS MANAGEMENT

Management Common to All Alternatives

Potash and related salts are the only minerals administered under this program and believed present in commercial quantities in the planning area. About 70,000 public land acres in the southeastern SRRA have moderate potential for occurrence and low potential for production of potash and related salts; the remainder of the planning area has low potential for occurrence of potash.

Nonenergy mineral leases are issued by USO. In areas of known mineral occurrence, leases are sold competitively; where mineral values are not known, the resource area could issue prospecting permits. These can lead to issuance of a preference right lease. Areas under wilderness review are not available for lease.

No interest has been expressed in leasing any nonenergy minerals in SRRA. If and when such interest is expressed, the RMP special conditions for oil and gas leasing will be applied. If these do not prove satisfactory, the RMP will be amended to establish leasing conditions and exploration requirements.

Applications for nonenergy leasable mineral exploration and leasing would be processed on a case-by-case basis under all six alternatives.

4211 RIGHTS-OF-WAY

Management Common to All Alternatives

Access to state or private inheld lands will not be denied. The rights of state and local governments to control and maintain use of their roads are established by law; the state has a further legal right to enjoy economic development of inheld state lands.

Management Under the Alternatives

Lands available for rights-of-way are divided into four major categories: (1) lands in designated right-of-way corridors where standard operating procedures apply, (2) lands outside designated corridors where standard conditions apply, (3) areas to be avoided and where special conditions may apply after site-specific NEPA documentation, and (4) areas to be excluded. The RMP identifies right-of-way corridors and lands to be available for additional rights-of-way, avoided, or excluded. These are shown on maps 24, 25, 26, 27, 28, and 29.

Right-of-way corridor designations were not identified under alternatives A, C, or D.

The lands identified for inclusion in right-of-way corridors in alternatives B, E, and F are listed below. In SRRA, right-of-way corridors (windows) would be 1 mile wide (0.5 mile from the centerline of existing powerlines), except where resource values dictate otherwise or where the powerlines go through private or state lands. In FPU, the right-of-way corridor would be 0.25 mile wide. All legal descriptions identify lands in the Salt Lake Meridian.

Legal Description			
Township	Range	Section	Location
16 S.	8 E	1, 12, 13, 24, 25	SRRA north boundary to Highway 31
17 S.	8 E.	1, 12, 14	
17 S.	8 E.	7, 17, 18, 21, 22, 23, 27, 34	UP&L Huntington Powerplant east to Highway 10
18 S.	8 E.	3, 10, 11	
18 S.	9 E.	9, 14, 15, 23, 24	Highway 10 east to SRRA/Price River Resource Area boundary
18 S.	10 E.	19, 29, 30, 33	
19 S.	10 E.	1, 3, 4, 11, 12	
19 S.	11 E.	7, 18	
21 S.	15 E.	33, 34, 35	Price River Resource Area/SRRA boundary east to Grand Resource Area
21 S.	16 E.	3, 4	
18 S.	9 E.	30, 31	Highway 10 south and west to FPU boundary
19 S.	8 E.	1, 12, 22, 23, 27, 33, 34	
20 S.	8 E.	3, 4, 19, 30, 31	
21 S.	7 E.	1	
22 S.	6 E.	12, 13, 14	
22 S.	7 E.	6	
22 S.	5 E.	25, 26, 35	FPU Boundary to Fishlake NF
23 S.	5 E.	3, 10, 15, 17, 18	

The following display summarizes right-of-way management actions that would occur under the six alternatives.

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
	Do not designate right-of-way corridors.	Designate existing groupings of major rights-of-way as corridors.	Do not designate right-of-way corridors.	Do not designate right-of-way corridors.	Designate existing groupings of major utility lines as corridors.	Designate existing groupings of major rights-of-way as corridors.
Designated corridors						
SRRA	0	22,870	0	0	12,890	21,540
FPU	0	4,470	0	0	4,170	2,900
Total	0	27,340	0	0	17,060	24,440
	Allow rights-of-way while resolving conflicts on a case-by-case basis.	Allow rights-of-way on all lands unless avoided where needed for livestock or mineral uses or excluded where needed for special management of relict vegetation areas.	Allow rights-of-way on all lands unless avoided to protect nonmotorized recreation opportunities and wildlife habitat or excluded where needed for special management of nonmotorized recreation and wildlife habitat.	Allow rights-of-way on all lands unless avoided to protect watershed and cultural resources or excluded where needed for special management of watershed or cultural resources.	Allow rights-of-way on all lands unless avoided to protect motorized recreation opportunities or excluded where needed for special management of motorized recreation.	Allow rights-of-way on all lands unless avoided to protect designated cultural, riparian, aquatic and watershed values and wildlife habitats or excluded where needed for special management of scenic or recreation values.
Acres available (standard conditions)						
SRRA	1,412,950	1,393,180	181,450	168,510	429,840	704,510
FPU	72,650	70,880	12,260	3,820	24,910	48,250
Total	1,485,600	1,464,060	193,710	172,330	454,750	752,760
Avoidance areas (special conditions)						
SRRA	50,890	45,760	812,270	77,990	1,019,200	732,820
FPU	2,700	0	60,390	7,600	46,270	24,200
Total	53,590	45,760	872,660	85,590	1,065,470	757,020
Exclusion areas						
SRRA	0	2,030	470,120	1,217,340	1,910	4,970
FPU	0	0	2,700	63,930	0	0
Total	0	2,030	472,820	1,281,270	1,910	4,970

4212 LANDS

Management Common to All Alternatives

Lands actions, including permits and leases, disposals, and easements and acquisitions, are considered upon application and cannot reasonably be predicted.

Management Under the Alternatives

Alternative A

Existing land uses (map 30) would be protected under the following special conditions.

Huntington Airport Lease. Use of the 330 leased acres would be allowed only with special conditions to ensure the use is consistent with the purpose for which the land was leased. Also, it would be allowed only with the consent of airport officials and would be subject to Federal Aviation Administration (FAA) regulations, Part 77, "Objects Affecting Navigable Airspace." Under alternative A, the Huntington Airport lease area would be

- open to mineral leasing with special conditions to prevent surface occupancy;
- open to disposal of mineral materials with special conditions;
- withdrawn from mineral entry;
- avoided for right-of-way grants;
- excluded from private or commercial use of woodland products, including collection of live or downed dead fuelwood for campfires;
- open to livestock use with special conditions;
- open to land treatments or range improvements with special conditions;
- open to development of watershed control structures with special conditions.

Recreation and Public Purpose Leases. Millsite Park (40 acres), Millsite Golf Course (160 acres), Clawson Motocross (160 acres), Castle Dale Fairgrounds (290 acres), and Goblin Valley State Park extension (720 acres) would be available only for uses consistent with the purpose for which the land was leased. Under alternative A, existing R&PP leases would be

- open to mineral leasing with special conditions to prevent surface occupancy;
- open to disposal of mineral materials with special conditions;
- withdrawn from mineral entry;
- avoided for right-of-way grants;
- excluded from private or commercial use of woodland products, including collection of live or downed dead fuelwood for campfires;
- open to livestock use with special conditions;
- open to land treatments or range improvements with special conditions;
- open to development of watershed control structures with special conditions.

Alternatives B, C, D, E, and F

Existing land uses (map 30) would be protected under the following special conditions.

Huntington Airport Lease. Use of the 330 leased acres would be allowed only with special conditions to ensure the use is consistent with the purpose for which the land was leased. Also, it would only be allowed with the consent of airport officials and would be subject to FAA regulations, Part 77, "Objects Affecting Navigable Airspace." Under alternatives B, C, D, E, and F, the Huntington Airport lease area would be

- open to mineral leasing with special conditions;
- open to disposal of mineral materials with special conditions;
- withdrawn from mineral entry;
- avoided for right-of-way grants;
- excluded from private or commercial use of woodland products, including collection of live or downed dead fuelwood for campfires;
- open to livestock use with special conditions;
- open to land treatments or range improvements with special conditions;
- open to development of watershed control structures with special conditions;

- designated as limited for ORV use, with use limited to designated roads and trails.

Recreation and Public Purpose Leases. Millsite Park (40 acres), Millsite Golf Course (160 acres), Clawson Motocross (160 acres), Castle Dale Fairgrounds (290 acres), and Goblin Valley State Park extension (720 acres) would be available only for uses consistent with the purpose for which the land was leased. Under alternatives B, C, D, E, and F, existing R&PP leases would be

- open to mineral leasing with special conditions;
- open to disposal of mineral materials with special conditions;
- withdrawn from mineral entry;
- avoided for right-of-way grants;
- excluded from private or commercial use of woodland products, including collection of live or downed dead fuelwood for campfires;
- open to livestock use with special conditions;
- open to land treatments or range improvements with special conditions;
- open to development of watershed control structures with special conditions;
- designated as limited for ORV use, with use limited to designated roads and trails.

New realty actions would be allowed within designated right-of-way corridor and available and avoidance areas identified on maps 24, 25, 26, 27, 28, and 29 subject to the applicable conditions. For other lands, new permits and leases would be allowed on a case-by-case basis when consistent with the needs and uses of other resources; each would be assessed through a site-specific NEPA document.

Land Disposals

Specific tracts of land would be managed for disposal under alternatives A, C, D, E, and F (maps 31, 32, 33, 34, and 35). No lands were identified for disposal under alternative B. Disposal of individual parcels may be precluded on a temporary or long-term basis because of mining claim location, presence of archaeological or historical sites, presence of habitat used by T/E species (unless disposal would benefit the species), or for other specific legal reasons. A plan amendment would be required for disposal of a tract that was not identified. Lands managed for disposal would meet the following conditions.

Tracts managed for disposal under available disposal authorities, including Section 203(a)(1) of FLPMA. Tracts are isolated from the large blocks of federal land, by either land ownership pattern or physical features, and are difficult and uneconomic to manage. Tracts 1 through 51 are in SRRA; 52 through 60 are in FPU. All legal descriptions identify lands in the Salt Lake Meridian.

Parcel Number	Legal Description			Alternative				
	Township	Range	Section	A	C	D	E	F
1	16 S.	7 E.	27, lots 1-12	X			X	
2	16 S.	7 E.	26, SW4NW4	X			X	
3	16 S.	7 E.	26, E2SW4	X			X	
4	16 S.	7 E.	34, S2NE4	X			X	
5	16 S.	7 E.	35, S2NE4				X	
6	16 S.	7 E.	35, NW4	X			X	
7	17 S.	7 E.	1, lots 4 & 5	X	X		X	
8	17 S.	7 E.	2, SW4	X	X		X	
9	17 S.	8 E.	5, lot 6, NW4SW4	X			X	
10	17 S.	9 E.	9, NW4SW4, SE4SW4	X				X
11	17 S.	9 E.	34, S2SW4	X				X
12	18 S.	9 E.	3, lots 1 & 2, SW4NE4	X				X
			SE4SW4, NW4SE4	X				X
13	18 S.	8 E.	14, NE4NE4	X				X
14	18 S.	8 E.	21, NW4SE4	X	X	X		X
15	18 S.	8 E.	21, N2NW4, SE4NW4	X	X			X
			NE4SW4, W2SE4	X	X			X
16	18 S.	8 E.	20, NE4NE4	X				X
17	18 S.	8 E.	23, SE4SE4	X	X	X	X	X
			26, NE4NE4	X	X	X	X	X
18	18 S.	8 E.	31, lot 3	X	X	X	X	
19	18 S.	8 E.	12, E2SE4	X	X		X	X
	18 S.	9 E.	7, N2SW4, SE4SW4	X	X		X	X
			SW4SE4	X	X		X	X
			18, N2NE4	X	X		X	X
20	18 S	9 E.	3, SE4SE4	X				
21	18 S.	9 E.	10, E2NE4	X				X
22	18 S.	9 E.	9, SE4, E2SW4	X				X
23	18 S.	9 E.	6, NW4SE4	X				X

Parcel Number	Legal Description			Alternative				
	Township	Range	Section	A	C	D	E	F
24	18 S.	9 E.	7, NE4NE4	X				X
25	18 S.	9 E.	17, SE4NW4	X				X
26	18 S.	9 E.	17, W2SE4	X				X
			20, NW4NW4, NW4NE4	X				X
27	18 S.	9 E.	20, S2NW4, SW4NE4	X	X		X	X
28	18 S.	9 E.	14	X	X		X	X
29	19 S.	7 E.	14, W2NW4, E2SW4		X			
30	19 S.	7 E.	14, NW4NE4, E2NW4		X		X	X
31	19 S.	8 E.	7, W2NW, NE4SW4					X
32	19 S.	8 E.	3, SE4SE4	X	X	X	X	X
33	19 S.	8 E.	11, SE4SE4	X			X	X
			12, SW4SW4	X			X	X
34	19 S.	8 E.	17, NW4NW4	X	X		X	X
35	19 S.	8 E.	17, E2SW4	X	X		X	X
36	19 S.	8 E.	20, lots 1-4, NE4SW4	X	X		X	X
			21, NE4, E2NW4, SW4NW4,	X	X		X	X
			NE4SW4, NE4SE4	X	X		X	X
37	19 S.	8 E.	35, N2NW4, SW4NW4		X			
38	19 S.	8 E.	31, N2NE4, SE4NE4, SE4,		X		X	X
			E2SW4, SW4SW4		X		X	X
	20 S.	7 E.	1, N2, NESE4		X		X	X
	20 S.	8 E.	6, N2, N2S2, SE4SW4,		X		X	X
			SW4SE4		X		X	X
			7, W2NE4, NE4NW4		X		X	X
39	20 S.	7 E.	4, SE4NE4	X	X		X	X
41	20 S.	7 E.	27, NW4NW4	X	X	X	X	X
42	20 S.	7 E.	12, SW4NE4, NW4SE4	X	X	X	X	X
43	21 S.	6 E.	25, N2SE4, NE4SW4	X		X		
44	21 S.	6 E.	25, SE4SW4, S2SE4		X		X	X
45	21 S.	6 E.	27, NW4NE4	X	X	X	X	X
46	21 S.	6 E.	27, lot 1, SW4NE4	X	X		X	X
47	21 S.	7 E.	31, NW4SW4	X	X	X	X	X
48	22 S.	6 E.	1, W2NE4, SE4NE4,		X	X	X	
			NE4SE4		X	X	X	
49	22 S.	6 E.	11, NE4NE4, SE4NW4	X	X	X	X	X
50	22 S.	6 E.	14, SW4NW4, NW4SW4	X	X	X	X	X
			15, lot 1	X	X	X	X	X
51	22 S.	6 E.	18, SW4SE4	X	X	X	X	X
			19, W2NE4, NW4SE4	X	X	X	X	X
52	22 S.	3 E.	5, lots 3, 4	X	X	X	X	X
53	22 S.	3 E.	6, SW4NE4	X	X	X	X	X
54	22 S.	3 E.	7, SE4NE4	X	X	X	X	X
55	22 S.	3 E.	33, NW4NE4	X	X	X	X	X
56	22 S.	3 E.	35, NE4SW4	X	X		X	X
57	22 S.	3 E.	35, W2SW4, SE4SW4	X	X	X	X	X
58	23 S.	3 E.	3, E2SE4, SE4NE4	X	X	X	X	X
			10, E2NE4	X	X	X	X	X
			11, NW4	X	X	X	X	X
59	23 S.	3 E.	10, W2SE4	X	X	X	X	X
60	23 S.	5 E.	31, lot 4, S2SE4	X	X		X	X

Tracts managed for disposal under available disposal authorities, including Section 203(a)(3) of FLPMA (community expansion). Because of their higher elevation, these lands would serve purposes such as infrastructure needs and related large-scale development which could not be met on nonfederal lands. Disposal of these lands would be limited to these purposes. All tracts identified are in SRRA.

Parcel Number	Legal Description			Alternative				
	Township	Range	Section	A	C	D	E	F
61	19 S.	7 E.	26, S2SW4	X	X		X	X
			35, W2NW4, NW4NE4NW4	X	X		X	X
62	19 S.	7 E.	35, S2NE4NW4, NE4NE4NW4	X	X	X	X	X
63	19 S.	7 E.	35, NW4SW4				X	
64	22 S.	6 E.	4, lot 6	X	X	X	X	X
65	22 S.	6 E.	4, lots 5 & 7	X	X		X	X

Tract managed for disposal under available disposal authorities, including Section 203(a)(3) of FLPMA (community expansion). An old barn and parts of three newer homes were constructed in trespass on this tract which is within Emery city limits. Disposal of this tract would be limited to the land owners in trespass . Tract is in SRRA.

Parcel	Legal Description			Alternative				
Number	Township	Range	Section	A	C	D	E	F
66	22 S.	6 E.	4, tract 37	X	X		X	X

Tracts managed for disposal under available disposal authorities, including Section 203(a)(3) of FLPMA (economic development). Utah Power and Light Company (UP&L) has indicated interest in purchasing these lands to use in conjunction with operation of the Huntington and Hunter powerplants. UP&L identified these lands because of their location in relation to existing facilities. Disposal of these lands would be limited to UP&L or their successors for this purpose only. All tracts identified are in SRRA.

Parcel	Legal Description			Alternative				
Number	Township	Range	Section	A	C	D	E	F
67	17 S.	8 E.	5, lot 6, NW4SW4	X	X	X		
68	19 S.	8 E.	22, SE4NE4, E2SE4,		X		X	X
			SW4SE4, SE4SW4		X		X	X
			27, NE4, E2NW2, E2SE4,		X		X	X
			SW4SE4		X		X	X

Tracts managed for disposal for recreation and public purposes under the Recreation and Public Purposes (R&PP) Act of 1926 and Sec. 212 of FLPMA to local governmental agencies only (potential R&PP disposal tracts). All tracts identified are in SRRA.

Parcel	Legal Description			Alternative				
Number	Township	Range	Section	A	C	D	E	F
69	16 S.	7 E.	27, lots 1-12		X			
70	16 S.	7 E.	26, SW4NW4		X			
71	16 S.	7 E.	26, E2SW4		X			
72	16 S.	7 E.	34, S2NE4		X			
73	16 S.	7 E.	35, NW4		X			
74	16 S.	7 E.	35, S2S2NE4	X	X			X

Parcel	Legal Description			Alternative				
Number	Township	Range	Section	A	C	D	E	F
75	20 S.	6 E.	11, all	X	X		X	X
			12, SW4, W2SE4, S2NW4	X	X		X	X
	20 S.	7 E.	7, E2E2SW4, E2W2E2SW4,	X	X		X	X
			W2SW4SE4SW4,	X	X		X	X
			S2SW4NW4SE4SW4	X	X		X	X
76	20 S.	7 E.	7, S2SE4SW4, S2N2SE4SW4			X		

Tracts managed for disposal for recreation and public purposes under the R&PP Act of 1926 and Sec. 212 of FLPMA to local governmental agencies only (existing R&PP lease). If the R&PP lease is terminated without going to patent, the tract would be managed for disposal under available disposal authorities, including Section 203(a)(3) of FLPMA (community expansion). Because of its higher elevation and location, this land would serve purposes such as infrastructure needs and related large-scale development which could not be met on nonfederal lands. Disposal of this tract would be limited to these purposes. The tract is in SRRA.

Parcel	Legal Description			Alternative				
Number	Township	Range	Section	A	C	D	E	F
77	22 S.	6 E.	4, lot 9	X	X	X	X	X

Acquisitions

BLM would act to acquire easements if and when the need is identified in activity plans or project proposals. These would be considered on a case-by-case basis and assessed through a site-specific NEPA document and land report prepared when an action is initiated. Lands identified for possible acquisition under the RMP alternatives are shown on maps 36, 37, and 38. A plan amendment would be required to acquire a tract not identified in the RMP.

The following display summarizes the lands identified for disposal or acquisition under the six alternatives.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Manage certain lands for disposal.	Manage no lands for disposal.	Manage certain lands for disposal unless needed for nonmotorized recreation or wildlife habitat.	Manage certain lands for disposal unless needed to protect or improve watershed or cultural resource management.	Manage certain lands for disposal unless needed for motorized recreation.	Manage certain lands for disposal for community expansion, economic development, and better management of isolated tracts.
Acres identified SRRA 5,780 FPU 1,040 Total 6,820	Acres identified SRRA 0 FPU 0 Total 0	Acres identified SRRA 6,140 FPU 830 Total 6,970	Acres identified SRRA 710 FPU 710 Total 1,420	Acres identified SRRA 6,770 FPU 1,040 Total 7,810	Acres identified SRRA 6,730 FPU 1,000 Total 7,730
Acquire nonfederal lands as needed on a case-by-case basis.	Acquire nonfederal lands as needed on a case-by-case basis.	Acquire nonfederal lands as needed for nonmotorized recreation or wildlife habitat uses.	Acquire nonfederal lands as needed to or improve watershed or cultural resource management.	Acquire nonfederal lands as needed on a case-by-case basis.	Acquire nonfederal lands as needed within scenic corridor, cultural and livestock areas.
Acres identified SRRA 0 FPU 0 Total 0	Acres identified SRRA 0 FPU 0 Total 0	Acres identified SRRA 7,160 FPU 1,420 Total 8,580	Acres identified SRRA 2,400 FPU 0 Total 2,400	Acres identified SRRA 0 FPU 0 Total 0	Acres identified SRRA 3,200 FPU 0 Total 3,200
		Lands in I-70 Scenic Corridor identified for possible acquisition (SRRA): T22S,R 8E,SLM,Sec 36 T22S,R 9E,SLM,Sec 32 T22S,R 9E,SLM,Sec 36 T22S,R10E,SLM,Sec 32 T22S,R12E,SLM,Sec 16 T22S,R13E,SLM,Sec 2 T23S,R 6E,SLM,Sec 19 T23S,R 6E,SLM,Sec 30 T23S,R 6E,SLM,Sec 31 T23S,R 7E,SLM,Sec 2 (FPU): T23S,R 5E,Secs 25, 36	The following lands within potential ACECs (all in SRRA) are identified for possible acquisition: Dry Lake Archaeological District: T23S,R16E,SLM,Sec 16 T23S,R16E,SLM,Sec 32 Tomsich Butte Historical District: T24S,R 8E,SLM,Sec 36 Little Black Mountain: T26S,R 6E,SLM,Sec 36		The following lands within potential ACECs are identified for possible acquisition: The Wedge: T19S,R10E,SLM,Sec 36 T20S,R10E,SLM,Sec 2 I-70 Scenic Corridor: T22S,R13E,SLM,Sec 2 Muddy Creek: T23S,R 7E,SLM,Sec 36 Big Flat Tops: T26S,R13E,SLM,Sec 36

4220 WITHDRAWAL AND CLASSIFICATION

Management Common to All Alternatives

Existing powersite withdrawals and public water reserves (PWRs) are shown on map 39. PWR withdrawals that meet PWR criteria will be continued, and those not meeting the criteria will be modified or terminated as determined in site-specific land reports. Powersite withdrawals identified by the Federal Energy Regulatory Commission (FERC) will be continued in accordance with the requirements of Section 24 of the Federal Power Act of June 10, 1920.

No lands are classified for retention under the Classification and Multiple Use (C&MU) Act nor classified for disposal under repealed authorities. There are no other existing BLM or other federal agency withdrawals. No petitions or applications requesting withdrawal have been filed, by either the BLM or other federal agencies.

Management Under the Alternatives

Lands presently classified for lease or disposal under the R&PP Act are segregated from appropriation under any land law, including locations under the mining laws. The classifications will be continued during the term of the leases. All legal descriptions are based in the Salt Lake Meridian.

Parcel	Legal Description			
Number	Township	Range	Section	Current Use, Expiration Date
1	18 S.	8 E.	35, NE4NW4, NE4, N2SE4	U-22940 - Castle Dale City Fairgrounds expires 09/11/1995
2	19 S.	7 E.	35, SE4	U-29388 - Emery County/ Clawson Motocross expires 08/18/1995
3	20 S.	6 E.	12, S2SW4NE4 N2NW4SE4	U-53817 - Ferron City/ Millsite Park expires 05/27/2005
4	20 S.	6 E.	7, lots 3, 4 12, lots 3, 4 W2W2NE4SW4, NW4NW4SE4SW4	U-54668 - Ferron City/ Millsite Golf Course expires 12/07/2011
5	26 S.	11 E.	3, lots 1-4, S2NE 4, lots 1-4, S2N2 9, E2NW4	U-48132 - Utah Division of State Parks and Recreation/Goblin Valley State Park Extension expires 01/23/2004
6	22 S.	6 E.	4, lot 9	U-48777 - Emery County School District/Emery School expires 05/30/1993

Lands presently leased for airport use under the Act of May 24, 1928, as amended, are segregated from all appropriation. The classification will be continued during the terms of the lease.

Parcel Number	Legal Description Township	Range	Section	Current Use, Expiration Date
1	17 S.	9 E.	9, W2NE4, SE4NE4, E2NW4, SW4NW4, NW4SE4, NE4SW4	SL-068958 - Emery County/ Huntington Airport expires 08/23/1991

With differing levels of emphasis on protection of certain resources, withdrawal recommendations would vary by alternative. (The Secretary would have to obtain Congressional approval for any withdrawal involving 5,000 acres or more.)

The following display summarizes withdrawal management actions that would occur under the six alternatives.

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Retain withdrawals:						
SRRA	1,780	1,780	1,780	800	1,690	1,780
FPU	0	0	0	0	0	0
Total	1,780	1,780	1,780	800	1,690	1,780
	Recommend withdrawals as needed, resolving conflicts on a case-by-case basis.	Recommend withdrawals if needed for livestock uses.	Recommend withdrawals if needed for nonmotorized recreation and wildlife habitat.	Recommend withdrawals if needed to protect or improve watershed or cultural resource management.	Recommend withdrawals if needed for motorized recreation uses.	Recommend withdrawals.
Acres identified						
SRRA	0	2,060	470,120	1,217,340	2,000	4,970
FPU	0	0	2,700	63,930	0	0
Total	0	2,060	472,820	1,282,870	2,000	4,970

Potential withdrawals	Potential withdrawals	Potential withdrawals	Potential withdrawals	Potential withdrawals	Potential withdrawals
None	Developed recreation sites; grazing ACECs: Bowknot Bend North Big Flat Top	Developed recreation sites; primitive recreation areas; scenic ACECs: Gilson Buttes I-70 Scenic Corr. Muddy Creek San Rafael Canyon San Rafael Reef Segers Hole Sids Mountain Vegetation ACEC Bowknot Bend Cultural ACEC Tomsich Butte	Developed recreation sites; primitive recreation areas; scenic ACECs: Gilson Buttes I-70 Scenic Corr. Muddy Creek San Rafael Canyon San Rafael Reef Segers Hole Sids Mountain Cultural ACECs: Pictographs Swasey Cabin Dry Lake Archaeological District Temple Mountain/ Tomsich Butte Historic District Critical watershed areas Riparian and aquatic habitat	Developed recreation sites; Temple Mountain Bike Trail.	Developed recreation sites; cultural ACECs: Pictographs Swasey Cabin Copper Globe Vegetation ACECs: Bowknot Bend Big Flat Tops

4311/4312 FOREST MANAGEMENT AND DEVELOPMENT

Management Common to All Alternatives

On the fairly small forested area (map 40), BLM will continue to sell over-the-counter permits for fuelwood, Christmas trees, and other woodland products in areas designated for these uses (map 41) at fair market value or by free use permit. Fuelwood harvest will be limited to pinyon and juniper unless specifically provided for in an activity plan. Onsite use of wood products by recreationists (such as for campfires) will be allowed unless specifically excluded in certain areas in the RMP.

Management Under the Alternatives

Under each alternative, the planning area is divided into four management categories for forest products: (1) lands available for management of forest products (intensive management areas), (2) lands where forest products are managed to enhance other uses (extensive management areas), (3) lands not available for management of forest products (special use categories) and (4) nonwoodland areas. RMP goals and management objectives were used to determine which areas would be assigned to which category and what conditions would be imposed on forest product use.

The following display summarizes forest management actions that would occur under the six alternatives.

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
	Designate areas for harvest of woodland products.	Designate areas for harvest of woodland products unless detrimental to livestock or mineral uses.	Designate areas for harvest of woodland products unless detrimental to nonmotorized recreation opportunities or wildlife habitat.	Designate areas for harvest of woodland products unless detrimental to watershed or cultural resources.	Designate areas for harvest of woodland products unless detrimental to motorized recreation opportunities.	Designate areas for harvest of woodland products unless detrimental to wildlife or critical soils areas. Open all areas to Christmas tree sales except where limited or excluded.
Standard conditions						
SRRA	395,350	401,130	6,550	85,110	197,570	138,610
FPU	35,540	36,320	18,040	15,580	22,730	30,580
Total	430,890	437,450	24,590	100,690	220,300	169,190
Special conditions						
SRRA	4,770	0	168,290	198,930	197,570	201,320
FPU	0	0	12,530	2,200	0	4,790
Total	4,770	0	180,820	201,130	197,570	206,110
Excluded from campfire use						
SRRA	490	510	1,100	6,800	510	570
FPU	0	0	0	0	0	0
Total	490	510	1,100	6,800	510	570
Excluded from harvest						
SRRA	14,830	13,820	240,110	130,910	237,660	75,010
FPU	780	0	5,740	18,540	13,590	950
Total	15,610	13,820	245,850	149,450	251,250	75,960

4321 WILD HORSE AND BURRO MANAGEMENT

Management Common to All Alternatives

Wild horse and burro habitat areas are shown on map 42. BLM will continue to monitor the number of wild horses and burros in each herd unit. When sufficient monitoring data are obtained, a herd management area plan (HMAP) will be prepared to guide management of herd management areas used by these animals. Wild equids will be allowed to increase until they reach the upper limit in each alternative. Excess horses will then be removed until the lower limit is achieved. The animals will then be allowed to increase until they reach the upper limit again. At that time the process will be repeated. A range of numbers of animals have been used instead of a single number because inventory methods are not 100 percent accurate and the forage available may change. Adjustments in numbers may also be necessary if monitoring data show a need for adjustments.

Excess wild horses or burros may be removed by helicopter, horseback or water trapping.

Management Under the Alternatives

With differing levels of emphasis on production and protection of other resources, herd populations would fluctuate accordingly.

Changes in use levels for wild horses and burros under the alternatives are explained in 4322 Grazing Management.

The following display summarizes wild horse and burro management actions that would occur under the six alternatives.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Manage for 200 to 325 wild horses and 70 to 100 wild burros.	Manage for 20 to 35 wild horses and 10 to 25 burros and to maintain populations at that level	Manage for 70 to 100 wild horses and 25 to 60 wild burros.	Manage for 90 to 115 wild horses and 50 to 70 wild burros.	Manage for 250 to 325 wild horses and 110 to 140 wild burros.	Manage for 75 to 125 wild horses and 30 to 70 wild burros.

Develop HMAPs	acres	Develop HMAPs	acres	Develop HMAPs	acres	Develop HMAPs	acres	Develop HMAPs	acres	Develop HMAPs	acres
SRRA (0)	0	SRRA (4)	475,680	SRRA (4)	475,680	SRRA (4)	475,680	SRRA (4)	475,680	SRRA (4)	475,680
FPU (0)	0	FPU (0)	0	FPU (0)	0	FPU (0)	0	FPU (0)	0	FPU (0)	0
Total (0)	0	Total (4)	475,680	Total (4)	475,680	Total (4)	475,680	Total (4)	475,680	Total (4)	475,680

4322 GRAZING MANAGEMENT

Management Common to All Alternatives

All grazing allotments covered in this RMP/EIS (map 43) have been evaluated for resource potential and conflicts and assigned to a management category in accordance with BLM range policy. The management category criteria are explained in appendix G, which also shows the category currently assigned to each grazing allotment.

A rangeland monitoring program has been established to provide data on range condition. Monitoring procedures are explained in appendix H. Changes in grazing allocations, if any, will be based on evaluation of range conditions through rangeland monitoring. Any change (increase or decrease) in available forage allocation will consider individual allotments and herd units.

Desired livestock utilization levels on grazing allotments will be as follows: 25 to 35 percent for spring use (3/1 to 6/30), and 40 to 60 percent for summer (7/1 to 9/30), fall (10/1 to 11/30), and winter (12/1 to 2/28) use. These percentages may vary based on ecological sites and vegetation communities within individual allotments.

Changes in livestock use may be made to resolve resource conflicts identified in the RMP or as a result of monitoring range condition and trend. Monitoring takes into account actual use, utilization, trend, and climate, to measure vegetation change and to determine the need for subsequent livestock adjustments.

In general, if agreements are not obtained, grazing use decisions will be issued within 5 years after publication of the rangeland program summary (RPS) following adoption of the RMP. Some allotments analyzed in this RMP/EIS already have the required 5 years of monitoring; on these allotments, changes may be implemented as soon as the RPS is issued.

Future changes in existing season of use or kind of livestock may be made, provided that (1) physiological needs of plants are met for sustained yield of forage and (2) resource conflicts do not result.

The decision whether to allow a change in season of use or kind of livestock will be made after assessing the proposal in NEPA documents prepared at that time.

An investment analysis will be done where an AMP suggests projects that would require expenditure of rangeland improvement funds. The analysis serves to (1) identify allotments where there is opportunity for a positive return on the investment; (2) integrate economic, resource, and social objectives in prioritizing investments; and (3) incorporate priorities and detailed investment analysis in annual work plans. The analysis would be done when a specific project is proposed.

Coordination of grazing responsibilities between BLM and the National Park Service (NPS) on lands within Glen Canyon National Recreation Area (NRA) was addressed in an umbrella memorandum of understanding [BLM and NPS, 1984], signed by the directors of NPS and BLM, and in an interagency agreement for grazing management [BLM and NPS, 1986], signed by the Director, Rocky Mountain Region, NPS, and the State Director, Utah, BLM. These agreements were taken into account in preparing the RMP.

The Link Flats area will be released from natural area status. In the late 1960s, the flats were thought to have potential as a natural area to recognize a supposedly ungrazed plant community; however, the area had been grazed by both wild horses and domestic livestock continuously for several decades.

State and local interest has been expressed in the control of poisonous or noxious weeds and nuisance insects. Insect or weed control will consider onsite and adjacent land uses and resource values. BLM will work closely with state and local officials when conducting eradication programs. Because of the small areas involved, control projects will be covered by separate project-specific NEPA documents, rather than in this RMP/EIS.

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AMPs are activity plans that will be prepared after approval of the RMP to meet its stated objectives. The RMP identifies allotments where existing AMPs will be implemented or modified and where new AMPs will be prepared and implemented (appendix I).

For a specific allotment, the AMP details management objectives, the grazing system to be used, and range improvements to be constructed. Ecological site information is used to establish management objectives, management potential, and treatment potential within the allotment. Grazing systems such as deferred rotation and rest-rotation could be used.

Grazing systems will be maintained, revised, or implemented, based on consideration of (1) objectives detailed in the AMP, (2) resource characteristics detailed in the RMP, (3) vegetation characteristics determined by monitoring, (4) availability of water, (5) operator requests, and (6) implementation costs.

Management Under the Alternatives

Currently, little or no forage is reserved for big game or wild horse and burros grazing the public lands. Conflicts between these animals and livestock may be resolved and adjustments in specific forage use levels made at the activity plan level or at any time deemed necessary as a result of rangeland monitoring.

Under alternative A, if use levels need adjustment or additional forage becomes available, equal consideration will be given to livestock, wildlife, and wild horses and burros based on rangeland monitoring.

Under alternative B, wildlife and wild horse and burro use levels may be adjusted to provide for livestock and mineral needs. If additional forage becomes available, preference would be given to livestock, but not to exceed total preference.

Under alternative C, livestock and wild horse and burro use levels may be adjusted to provide for wildlife and recreation needs. If additional forage becomes available, preference would be given to wildlife, but not to exceed prior stable numbers.

Under alternative D, livestock, wildlife, and wild horse and burro use levels may be adjusted to provide for protection of watershed and cultural values. Additional forage not needed for this protection may be used by these animals with equal consideration, based on rangeland monitoring.

Under alternative E, livestock, wildlife, and wild horse and burro use levels may be adjusted to provide for motorized recreation. If additional forage becomes available, and if conflicts with motorized recreation would not result, equal consideration would be given to these animals, based on rangeland monitoring.

Under alternative F, livestock and wild horse and burro use levels may be adjusted to provide for protection of critical soils and crucial wildlife habitat. If additional forage becomes available, and crucial wildlife habitat and critical soils areas would not deteriorate, equal consideration would be given to livestock, wildlife, and wild horses and burros, based on rangeland monitoring.

Range improvements facilitate grazing management. Potential for land treatments is determined from ecological site information; areas available for improvements are determined in the RMP. Areas available for range improvements under this alternative are shown on maps 44, 45, 46, 47, and 48. The location, extent, and scheduling of specific range projects will be determined on an individual allotment basis and will depend on operator contributions and BLM funding capability. Existing land treatments may be maintained.

Grazing actions are shown on maps 49, 50, 51, 52, 53, and 54. Alternative management actions by grazing allotment are described in appendix I.

Special Management Designations

Under alternatives B, C, D, E, and F, special management conditions have been developed for ACECs (all within SRRA) that would be administered under the grazing program to protect relict vegetation areas. All relict vegetation ACECs would be used for (1) research and experiments to provide a baseline for rangeland studies and (2) similar comparative ecological studies of relict plant communities.

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Activities within the ACECs would be approved only with special conditions to protect the relict plant communities.

Changes to the level of livestock use in riparian areas could occur as a result of monitoring and riparian inventory of those areas in alternative D.

The areas that would be designated under each alternative, along with the special management conditions that would apply to the specific ACECs under that alternative, are shown here.

Alternative B

The Bowknot Bend (1,830 acres), North Big Flat Top (190 acres), and San Rafael Reef (43,870 acres) ACECs (map 12) would cover a total of 46,080 acres. Special conditions applied to these areas would protect relict vegetation. Under alternative B, Bowknot Bend and North Big Flat Top ACECs would be

- closed to mineral leasing and to disposal of mineral materials;
- withdrawn from mineral entry;
- excluded from right-of-way grants;
- excluded from private or commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- excluded from livestock use;
- excluded from land treatments and range improvements, except for test plots and facilities necessary for study of the relict and near-relict plant communities;
- designated as closed to ORV use.

Approximately 2,000 acres of relict plant communities exist within the San Rafael Reef ACEC. Under alternative B, those communities would be protected in the same ways as Bowknot Bend and North Big Flat Tops. The remainder of San Rafael Reef ACEC (approximately 41,860 acres) would be

- open to mineral leasing and to disposal of mineral materials with special conditions to prevent surface disturbance within the relict plant communities;
- open to mineral entry with plans of operation subject to conditions precluding surface use of the relict plant communities;
- avoided for right-of-way grants;
- excluded from private or commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- open to livestock use;
- open to land treatments and range improvements, with special conditions to prevent surface disturbance within the relict plant communities;
- designated as limited for ORV use, with use limited to designated roads and trails.

Alternative C

The Bowknot Bend (1,830 acres) and North Big Flat Top (190 acres) ACECs (map 13) would cover a total of 2,020 acres. Under alternative C, the Bowknot Bend ACEC would be managed under the special conditions for ROS primitive (P) class and excluded from grazing. The North Big Flat Top ACEC would be

- open to mineral leasing with special conditions to prevent surface occupancy;
- closed to disposal of mineral materials;
- open to mineral entry, with plans of operations subject to conditions precluding surface use of the ACEC;
- excluded from right-of-way grants;
- excluded from private or commercial use of woodland products, including collection of downed dead wood for campfires;
- excluded from livestock use;
- excluded from land treatments or range improvements, except for test plots and facilities necessary for study of the relict and near-relict plant communities;
- designated as closed to ORV use;
- managed as visual resource management (VRM) class I.

Alternative D

The Bowknot Bend (1,830 acres), Hebes Mountain (960 acres) and North Big Flat Top (190 acres) ACECs (map 14) would cover a total of 2,980 acres. Under alternative D, all three ACECs would be

- closed to mineral leasing;
- closed to disposal of mineral materials;
- closed to mineral entry;
- excluded from right-of-way grants;

- excluded from private or commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- excluded from livestock use;
- excluded from land treatments or range improvements, except for water control structures and test plots and facilities necessary for study of the relict and near-relict plant communities;
- designated as closed to ORV use.

Alternative E

The Bowknot Bend (1,830 acres) and North Big Flat Top (190 acres) ACECs (map 15) would cover a total of 2,020 acres. Under alternative E, both ACECs would be

- open to mineral leasing with special conditions to prevent surface occupancy;
- closed to disposal of mineral materials;
- open to mineral entry, with plans of operations subject to special conditions on surface use of the ACEC;
- avoided for right-of-way grants;
- excluded from livestock use;
- excluded from private or commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- excluded from land treatments or range improvements, except for test plots and facilities necessary for study of the relict and near-relict plant communities;
- designated as limited for ORV use, with use limited to existing roads and trails.

Alternative F

The Bowknot Bend (1,830 acres) and Big Flat Tops (2,640 acres) ACECs (map 16) would cover a total of 4,470 acres. Under alternative F, both ACECs would be

- closed to mineral leasing and to disposal of mineral materials;
- withdrawn from mineral entry;
- excluded from right-of-way grants;
- excluded from private or commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- excluded from livestock use;
- excluded from land treatments or range improvements, except for test plots and facilities necessary for study of the relict and near-relict plant communities;
- designated as closed to ORV use.

The following display summarizes grazing management actions that would occur under the six alternatives.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Maintain the area currently allotted to livestock grazing.	Allot all acreage to livestock grazing.	Allot rangelands to livestock grazing where not needed for wildlife habitat and where grazing does not conflict with nonmotorized recreation opportunities.	Allot rangelands to livestock grazing where it does not conflict with watershed or cultural resources management.	Allot rangelands to livestock grazing where it does not conflict with motorized recreation opportunities.	Allot rangelands to livestock grazing with restrictions to protect critical soils and reduce salinity in the Colorado River.
Allotted to livestock, wildlife, wild horses and burros	**Allotted to livestock, wildlife, wild horses and burros**	**Allotted to livestock, wildlife, wild horses and burros**	**Allotted to livestock, wildlife, wild horses and burros**	**Allotted to livestock, wildlife, wild horses and burros**	**Allotted to livestock, wildlife, wild horses and burros**
SRRA 1,421,880	SRRA 1,430,580	SRRA 1,345,240	SRRA 1,403,390	SRRA 1,418,810	SRRA 1,416,080
FPU 190,240	FPU 190,240	FPU 190,240	FPU 190,240	FPU 190,240	FPU 190,240
Total 1,612,120	Total 1,620,820	Total 1,535,480	Total 1,592,630	Total 1,609,050	Total 1,606,620
Allotted to wildlife	**Allotted to wildlife**	**Allotted to wildlife**	**Allotted to wildlife**	**Allotted to wildlife**	**Allotted to wildlife**
SRRA 630	SRRA 0	SRRA 52,720	SRRA 630	SRRA 630	SRRA 630
FPU 0	FPU 0	FPU 0	FPU 0	FPU 0	FPU 0
Total 630	Total 0	Total 52,720	Total 630	Total 630	Total 630
Unallotted	**Unallotted**	**Unallotted**	**Unallotted**	**Unallotted**	**Unallotted**
SRRA 1,730	SRRA 0	SRRA 1,730	SRRA 1,730	SRRA 1,730	SRRA 1,730
FPU 0	FPU 0	FPU 0	FPU 0	FPU 0	FPU 0
Total 1,730	Total 0	Total 1,730	Total 1,730	Total 1,730	Total 1,730
Exclude livestock	**Exclude livestock**	**Exclude livestock**	**Exclude livestock**	**Exclude livestock**	**Exclude livestock**
SRRA (2) 4,110	SRRA (0) 4,020	SRRA (18) 58,220	SRRA (2) 7,090	SRRA (2) 6,130	SRRA (2) 8,580
FPU (0) 0	FPU (0) 0	FPU (0) 0	FPU (0) 0	FPU (0) 0	FPU (0) 0
Total (2) 4,110	Total (0) 4,020	Total (18) 58,220	Total (2) 7,090	Total (2) 6,130	Total (2) 8,580

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Designate ACECs acres	Designate ACECs acres	Designate ACECs acres	Designate ACECs acres	Designate ACECs acres	Designate ACECs acres
	Bowknot Bend 1,830	Bowknot Bend 1,830	Bowknot Bend 1,830	Bowknot Bend 1,830	Bowknot Bend 1,830
	North Big Flat Top 190	North Big Flat Top 190	North Big Flat Top 190	North Big Flat Top 190	Big Flat Tops 2,640
	San Rafael Reef 43,870	San Rafael Reef 67,520	San Rafael Reef 43,870		
			Hebes Mountain 960		
Total (0) 0	Total (3) 45,890	Total (3) 69,540	Total (4) 46,850	Total (2) 2,020	Total (2) 4,470
Develop and implement grazing management systems. Modify and implement existing AMPs. Develop new AMPs.	Develop and implement grazing management systems. Modify and implement existing AMPs. Develop new AMPs.	Develop and implement grazing management systems. Modify and implement existing AMPs. Develop new AMPs.	Develop and implement grazing management systems. Modify and implement existing AMPs. Develop new AMPs.	Develop and implement grazing management systems. Modify and implement existing AMPs. Develop new AMPs.	Develop and implement grazing management systems. Modify and implement existing AMPs. Develop new AMPs.
Existing AMPs SRRA (5) FPU (1) Total (6)	Existing AMPs SRRA (16) FPU (1) Total (17)	Existing AMPs SRRA (12) FPU (1) Total (13)	Existing AMPs SRRA (9) FPU (1) Total (10)	Existing AMPs SRRA (16) FPU (1) Total (17)	Existing AMPs SRRA (16) FPU (1) Total (17)
New AMPs SRRA (0) FPU (0) Total (0)	New AMPs SRRA (40) FPU (4) Total (44)	New AMPs SRRA (21) FPU (4) Total (25)	New AMPs SRRA (15) FPU (4) Total (19)	New AMPs SRRA (29) FPU (4) Total (33)	New AMPs SRRA (27) FPU (4) Total (31)

(Continued)

Alternative A		Alternative B		Alternative C		Alternative D		Alternative E		Alternative F	
Eliminate fall and spring grazing on certain allotments.		Eliminate fall and spring grazing on certain allotments.		Eliminate fall and spring grazing on certain allotments.		Eliminate spring grazing on certain allotments.		Eliminate fall and spring grazing on certain allotments.		Eliminage spring grazing on certain allotments.	
Allotments	acres	Allotments	acres	Allotments	acres	Allotments	acres	Allotments	acres	Allotments	acres
SRRA (0)	0	SRRA (0)	0	SRRA (63)	1,197,983	SRRA (79)	1,198,813	SRRA (72)	1,188,723	SRRA (40)	597,300
FPU (0)	0	FPU (0)	0	FPU (6)	190,240	FPU (6)	190,240	FPU (6)	190,240	FPU (3)	110,670
Total (0)	0	Total (0)	0	Total (69)	1,388,223	Total (85)	1,389,053	Total (78)	1,378,963	Total (43)	707,970
Manage rangelands to produce livestock forage and develop water sources to meet active preference.		Manage rangelands to produce livestock forage and develop water sources to meet total preference.		Manage rangelands to allow for livestock use where it does not conflict with nonmotorized recreation opportunities or wildlife habitat uses.		Manage rangelands to allow for livestock use where it does not conflict with watershed or cultural resource management.		Manage rangelands to allow for livestock use where it does not conflict with motorized recreation opportunities.		Manage rangelands to produce livestock forage and water to meet current demand so long as certain cultural, riparian, and watershed values and crucial wildlife habitats are protected; exclude rangeland use in areas of designated cultural values.	
5-year average AUMs		5-year average AUMs		5-year average AUMs		5-year average AUMs		5-year average AUMs		5-year average AUMs	
SRRA	48,636	SRRA	86,078	SRRA	38,904	SRRA	24,980	SRRA	47,577	SRRA	48,959
FPU	7,525	FPU	9,928	FPU	6,476	FPU	3,702	FPU	7,525	FPU	6,792
Total	56,161	Total	96,006	Total	45,380	Total	28,682	Total	55,102	Total	55,751
Active preference AUMs		Active preference AUMs		Active preference AUMs		Active preference AUMs		Active preference AUMs		Active preference AUMs	
SRRA	78,164	SRRA	86,078	SRRA	64,409	SRRA	39,624	SRRA	77,150	SRRA	77,999
FPU	9,378	FPU	9,928	FPU	8,349	FPU	4,634	FPU	9,378	FPU	8,199
Total	87,542	Total	96,006	Total	72,758	Total	44,258	Total	86,528	Total	86,198
Suspended nonuse AUMs		Suspended nonuse AUMs		Suspended nonuse AUMs		Suspended nonuse AUMs		Suspended nonuse AUMs		Suspended nonuse AUMs	
SRRA	103,520	SRRA	111,464	SRRA	89,795	SRRA	65,010	SRRA	102,536	SRRA	103,385
FPU	9,378	FPU	9,928	FPU	8,349	FPU	4,634	FPU	9,378	FPU	8,199
Total	112,928	Total	121,392	Total	98,144	Total	69,644	Total	119,914	Total	111,584

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Construct rangeland improvements to improve livestock distribution and forage utilization.	Construct rangeland improvements to improve livestock distribution and forage utilization.	Construct rangeland improvements to improve livestock distribution and forage utilization.	Construct rangeland improvements to improve livestock distribution and forage utilization.	Construct rangeland improvements to improve livestock distribution and forage utilization.	Construct rangeland improvements to improve livestock distribution and forage utilization.
Livestock waters	Livestock waters	Livestock waters	Livestock waters	Livestock waters	Livestock waters
SRRA (12)	SRRA (101)	SRRA (0)	SRRA (0)	SRRA (12)	SRRA (12)
FPU (12)	FPU (9)	FPU (0)	FPU (0)	FPU (12)	FPU (12)
Total (24)	Total (110)	Total (0)	Total (0)	Total (24)	Total (24)
Fences (miles)	Fences (miles)	Fences (miles)	Fences (miles)	Fences (miles)	Fences (miles)
SRRA (12)	SRRA (70)	SRRA (0)	SRRA (0)	SRRA (12)	SRRA (36)
FPU (12)	FPU (10)	FPU (0)	FPU (0)	FPU (12)	FPU (24)
Total (24)	Total (80)	Total (0)	Total (0)	Total (24)	Total (60)
Vegetation manipulation — acres	Vegetation manipulation — acres	Vegetation manipulation — acres	Vegetation manipulation — acres	Vegetation manipulation — acres	Vegetation manipulation — acres
SRRA 0	SRRA 0	SRRA 0	SRRA 0	SRRA 0	SRRA 0
FPU 0	FPU 2,000	FPU 2,000	FPU 0	FPU 2,000	FPU 0
Total 0	Total 2,000	Total 2,000	Total 0	Total 2,000	Total 0

(Continued)

4331 CULTURAL RESOURCE MANAGEMENT

Management Common to All Alternatives

Potential cultural resources will be evaluated, and identified resources will be protected as required by law, regulation, and policy. Consultation with SHPO and the Advisory Council on Historic Preservation will occur wherever mandated.

Fossils of scientific interest (other than petrified wood), including petrified dinosaur bone, may not be collected on public land. These resources are covered by the Antiquities Act, which prohibits excavation or appropriation of paleontological resources without a permit. The act also protects these resources from impacts of development. For example, the Tempskya fossil fern site near Castle Dale would require site-specific mitigation measures prepared at the time any project was proposed which could disturb the fossil bed. Recreational rockhounding occurs throughout the planning area. No part of the planning area will be designated as closed to rockhounding.

Sites listed in the National Register of Historic Places and other known sites eligible for listing in that register will be managed in consultation with SHPO and the Advisory Council on Historic Preservation. Listed sites include the Black Dragon Canyon pictographs, Buckhorn rock art, Rochester-Muddy pictographs, and the Denver-Rio Grande lime kiln.

All areas proposed for surface disturbance or rehabilitation that have not been previously inventoried for cultural resources must be inventoried prior to starting the activity. Direct and indirect damage will be avoided to the extent possible without curtailing valid rights.

Surface disturbance will be allowed only after cultural resource management objectives are met. All sites will be avoided or mitigated in keeping with the specific management objectives assigned.

To protect historic values with Temple Mountain, Tomsich Butte, and Copper Globe Historic Districts, an intensive data recovery program will be initiated. The program will include a search of historic literature and documents and compilation of oral histories in order to tie any significant events or persons to specific locations on the ground.

To protect Dry Lake Archaeological District from piecemeal destruction, a study of the whole area will be initiated. The program will identify the archaeological values and their spacial, temporal, and cultural relationships.

Cultural Resource Management Objectives

During activity-level planning after completion of the RMP, all cultural resources in the planning area will be assigned to one of three management categories based on the following objectives: (1) conservation, (2) public values, or (3) information potential.

Conservation

The objective for the category managed for conservation is to protect a 20 percent proportionally representative sample of all known site types from both natural and human-caused deterioration. Sites within this 20 percent sample will be protected from natural deterioration and closed to conflicting uses; they will remain under protective management until all similar non-conservation sites are used and data recovery technology has developed sufficiently that their use would make a major contribution to the archaeological study of the area.

The rationale for the 20 percent sample size is that research effectiveness declines greatly above that level. Sampling studies have shown that the amount of new information obtainable (compared to redundant data) falls significantly around a 20 percent sample figure. This makes expenditure of more time, effort, or research money on a larger scale sample size unprofitable.

The area manager will use the following criteria to place sites in the 20 percent sample covered by the conservation category:

(1) proportional representation of site types;
(2) sites that are currently in the best condition;
(3) sites located in areas with few current surface use conflicts;
(4) sites nominated by cultural resource professionals or other interested parties as having values that need to be conserved for the future;
(5) samples of large linear features, such as historic trails (the feature need not be conserved in total); and
(6) additional sites as new sites are located, in order to keep the sample at 20 percent of the known total.

Sites placed in the conservation category will be listed in files kept at the resource area office. Site categorization is intended to be permanent; however, some latitude must be used in order to conserve a 20 percent sample for the future. If a listed site is destroyed, damaged, or endangered, a similar site in as good or better condition may be substituted.

Public Values

The number of sites placed in the category managed for public values is expected to be small. Objectives for this category are:

(1) to provide access to these sites for the general public or particular segments of the public (such as providing Native American groups access to their sacred sites);

(2) to provide sufficient supervision to protect both the public and the scientific values of these sites;

(3) where there are conflicts between the protection needs of these values, to mitigate impacts to scientific values before the site is turned over to public use;

(4) to emphasize the concerns of specific cultural or social groups in managing sites needed for religious or culturally important uses;

(5) to prepare specific site management plans for all sites in this category.

Sites managed for public values must first have their information potential recovered through appropriate study guided by an approved research design, in order to mitigate the impacts of visitor use and to provide information for interpretation. Test or sampling excavations would be made to define the extent of the sites and obtain information needed to interpret them. Interpretive displays and improved access would be constructed.

Information Potential

Most cultural resources will be managed under the following information potential objectives:

(1) to make all sites in this category available for research;

(2) to protect these sites until they have been appropriately studied;

(3) to ensure that all study is guided by an appropriate research design;

(4) to mitigate conflicts with other resource uses by appropriate study.

BLM will determine what is appropriate study.

Sites managed for their information potential will be avoided until their potential is collected through study directed by an approved research design.

Management Under the Alternatives

Under alternatives B, C, D, E, and F, special management conditions have been developed for ACECs that would be administered under the cultural resource management program. All cultural resource ACECs would be designated for one of the three use categories discussed above.

Special Management Designations

The areas that would be designated under each alternative, along with the special management conditions that would apply to the specific ACECs under that alternative, are shown here.

Alternative B

The I-70 Pictographs ACEC (map 12), three separate tracts covering a total of 30 acres, would be designated for public values. Special conditions would protect these values from surface disturbance which could destroy or diminish their values. Testing or sampling excavations would be made to define the extent of the sites and obtain information needed to interpret them. Interpretive displays and improved access would be constructed. Under alternative B, the ACEC would be
- closed to mineral leasing;
- closed to disposal of mineral materials;
- withdrawn from mineral entry;
- excluded from right-of-way grants;
- excluded from private or commercial use of woodland products, including collection of live or downed dead wood for campfires;
- excluded from livestock use;
- excluded from land treatment and range improvements except for watershed control structures where these would protect cultural resource values;
- designated as limited for ORV use, with use limited to designated roads and trails.

Alternative C

The I-70 Pictographs (30 acres) would be designated as a special emphasis area to be managed for public values within the I-70 Scenic Corridor ACEC (described under 4333, visual resource management (VRM)). The Dry Lake Archaeological District ACEC (16,990 acres) and the Temple Mountain and Tomsich Butte Historic District ACECs (4,700 acres) would be designated for information. The three ACECs and the special emphasis area would cover a total of 21,720 acres, all within SRRA (map 13). Special conditions would protect these values from surface disturbance which could destroy or diminish their values.

Under alternative C, the I-70 Pictographs special emphasis area of the I-70 Scenic Corridor ACEC would be protected and interpreted for public use. Testing or sampling excavations would be made to define the extent of the sites and obtain information needed to interpret them. Interpretive displays and improved access would be constructed. In addition to the special conditions given for the I-70 Scenic Corridor ACEC, the special emphasis area would be
- excluded from right-of-way grants;
- excluded from private or commercial use of woodland products, including collection of live or downed dead wood for campfires;
- excluded from livestock use;
- excluded from land treatments and range improvements except for watershed control structures where these would protect cultural resource values.

Under alternative C, the Dry Lake Archaeological District ACEC would be designated to protect the information values of paleo-Indian sites thought to be present. The ACEC would be
- open to mineral leasing with special conditions to prevent surface occupancy;
- closed to disposal of mineral materials;
- open to mineral entry, with plans of operations subject to conditions precluding surface use of the ACEC;
- avoided for right-of-way grants
- excluded from private or commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- excluded from land treatments and range improvements, except for wildlife habitat improvements;
- designated as closed to ORV use.

Temple Mountain and Tomsich Butte Historic District ACECs would be designated to protect the information values of historic mining use thought to be present. No historic structures will be disturbed until features have been recorded. Under alternative C, the Temple Mountain ACEC would be
- open to mineral leasing with special stipulations to prevent surface occupancy;
- closed to disposal of mineral materials;

- open to mineral entry, with plans of operations;
- avoided for right-of-way grants;
- excluded from private or commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- excluded from land treatments and range improvements except for wildlife habitat improvements;
- designated as closed to ORV use.

The Tomsich Butte ACEC overlies the Muddy Creek ACEC administered under program 4333, VRM; it would also be managed under the special conditions given for ROS P class areas under 4333, Recreation. In addition to special conditions for Muddy Creek ACEC and ROS P class areas under alternative C, Tomsich Butte ACEC would be excluded from development of range improvements and historic structures would be protected from disturbance until they have been recorded.

Alternative D

The Pictographs (40 acres), Copper Globe Mine (220 acres), and Swasey Cabin (220 acres) would be designated to be managed for public values. Dry Lake Archaeological District ACEC (16,990 acres) and the Temple Mountain (2,660 acres) and Tomsich Butte (2,040 acres) Historic District ACECs would be designated for information. The Little Black Mountain ACEC (2,160 acres) would be designated for conservation. The seven ACECs administered under the cultural resource management program would cover a total of 24,330 acres, all within SRRA (map 14). Special conditions would protect these values from surface disturbance which could destroy or diminish their values.

The Pictographs ACEC would be protected and interpreted for public use. The area, which includes the I-70 Pictographs and the Rochester Rock Art sites, would be protected from all surface disturbing activities. Testing or sampling excavations would be made to define the extent of the sites and obtain information needed to interpret them. Interpretive displays and improved access would be constructed. Under alternative D, the area would be
- closed to mineral entry;
- closed to disposal of mineral materials;
- withdrawn from mineral entry;
- excluded from right-of-way grants;
- excluded from private or commercial use of woodland products, including collection of live or downed dead wood for campfires;
- excluded from livestock use;
- excluded from land treatments and range improvements except for watershed control structures where these would protect cultural resource values;
- designated as limited for ORV use, with use limited to designated roads and trails.

The Dry Lake Archaeological District ACEC would be designated to protect the information values of paleo-Indian sites thought to be present. Under alternative D, the ACEC would be
- closed to mineral leasing;
- closed to disposal of mineral materials;
- withdrawn from mineral entry;
- excluded from right-of-way grants;
- excluded from private or commercial use of woodland products, including collection of live or downed dead wood for campfires;
- excluded from livestock use and range improvements except for water control structures that would protect cultural resources;
- excluded from land treatment and range improvements, except for water control structures where these would protect cultural resource values;
- designated as closed to ORV use.

The Temple Mountain and Tomsich Butte Historic District ACECs would be designated to protect the public values of historic mining use thought to be present. Under alternative D, both areas would be
- closed to mineral leasing;
- closed to disposal of mineral materials;
- withdrawn from mineral entry;
- excluded from right-of-way grants;
- excluded from private or commercial use of woodland products, including collection of live or downed dead wood for campfires;
- excluded from livestock use;
- excluded from land treatment and range improvements except for water control structures where these would protect cultural resource values;
- designated as closed to ORV use.

The Swasey Cabin ACEC would be designated to protect the public values of historic ranching use thought to be present. Under alternative D, the ACEC would be

- closed to mineral leasing;
- closed to disposal of mineral materials;
- withdrawn from mineral entry;
- excluded from right-of-way grants;
- excluded from private or commercial use of woodland products, but available for collection of downed dead wood for campfires;
- excluded from grazing use except livestock trailing under an approved permit;
- excluded from land treatments and range improvements, except for water control structures where these would protect historic values;
- designated as limited for ORV use, with use limited to designated roads and trails;
- managed as VRM class II;

The Little Black Mountain ACEC would be designated to protect the geologic feature found in the igneous intrusive landform: exposed dikes and sills of black basalt. Under alternative D, the ACEC would be

- closed to mineral leasing;
- closed to disposal of mineral materials;
- closed to mineral entry;
- excluded from right-of-way grants;
- excluded from private or commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- excluded from land treatments and range improvements except for water control structures;
- designated as closed to ORV use.

Alternative E

The I-70 Pictographs (30 acres) would be designated as a special emphasis area to be managed for public values within the I-70 Scenic Corridor ACEC (described under 4333, VRM). Dry Lake Archaeological District ACEC (16,990 acres) and the Temple Mountain (2,660 acres) and Tomsich Butte (2,040 acres) Historic District ACECs would be designated for information. The special emphasis area and the three ACECs administered under the cultural resource management program would cover a total of 21,720 acres, all within SRRA (map 15). Special conditions would protect these values from surface disturbance which could destroy or diminish their values.

The I-70 Pictographs special emphasis area of the I-70 Scenic Corridor ACEC would be protected and interpreted for public use. Testing or sampling excavations would be made to define the extent of the sites and obtain information needed to interpret them. Interpretive displays and improved access would be constructed. In addition to the special conditions given for the I-70 Scenic Corridor ACEC under alternative E, the special emphasis area would be

- excluded from right-of-way grants;
- excluded from private or commercial use of woodland products, including collection of live or downed dead wood for campfires;
- excluded from land treatments and range improvements, except for watershed control structures where these would protect cultural resource values.

The Dry Lake Archaeological District ACEC would be designated to protect the information values of paleo-Indian sites thought to be present. Under alternative E, the ACEC would be

- open for mineral leasing with special conditions to prevent surface occupancy;
- closed to disposal of mineral materials;
- open to mineral entry, with plans of operations;
- avoided for right-of-way grants;
- excluded from private or commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- excluded from land treatments and range improvements
- designated as limited for ORV use, with use limited to existing roads and trails.

Temple Mountain and Tomsich Butte Historic District ACECs would be designated to protect the information values of historic mining use thought to be present. Under alternative E, both ACECs would be

- open to mineral leasing with special conditions to prevent surface occupancy;
- closed to disposal of mineral materials;
- open to mineral entry, with plans of operations;

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- avoided for right-of-way grants;
- excluded from private or commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires.
- excluded from land treatments and range improvements;
- designated as limited for ORV use, with use limited to existing roads and trails.

Alternative F

The Pictographs (I-70 and Rochester, 40 acres) and the Copper Globe Mine (220 acres) and Swasey Cabin (220 acres) ACECs would be designated for public values (described under 4333, VRM). Dry Lake Archaeological District ACEC (16,990 acres) and the Temple Mountain Historic District ACEC (2,660 acres) and Tomsich Butte Historic District special emphasis area (2,040 acres) within the Muddy Creek ACEC would be designated for information. The six ACECs administered under the cultural resource management program would cover a total of 22,170 acres, all in SRRA (map 16).

The Pictograph ACEC would be protected and interpreted for public use. Special conditions would protect these values from surface disturbance which could destroy or diminish their values. Testing or sampling excavations would be made to define the extent of the sites and obtain information needed to interpret them. Interpretive displays and improved access would be constructed. Under alternative F, the area would be
- closed to mineral leasing;
- closed to disposal of mineral materials;
- withdrawn from mineral entry;
- excluded from right-of-way grants;
- excluded from private or commercial use of woodland products, including collection of live or downed dead wood for campfires;
- excluded from livestock use;
- excluded from land treatments and range improvements except for watershed control structures where these would protect cultural resource values;
- designated as limited to ORV use, with use limited to designated roads and trails.

The Copper Globe Mine ACEC would be designated to protect the public values of historic mining use thought to be present. Under alternative F, the ACEC would be
- closed to mineral leasing;
- closed to disposal of mineral materials;
- withdrawn from mineral entry;
- excluded from right-of-way grants;
- excluded from private or commercial use of woodland products, including collection of live or downed dead wood for campfires;
- excluded from land treatments and range improvements, except for water control structures where these would protect historic values;
- designated as limited for ORV use, with use limited to designated roads and trails;
- managed as VRM class II.

The Swasey Cabin ACEC would be designated to protect the public values of historic ranching use thought to be present. Under alternative F, the ACEC would be
- closed to mineral leasing;
- closed to disposal of mineral materials;
- withdrawn from mineral entry;
- excluded from right-of-way grants;
- excluded from private or commercial use of woodland products, but available for collection of downed dead wood for campfires.
- excluded from grazing use except livestock trailing under an approved permit;
- excluded from land treatments and range improvements, except for water control structures where these would protect historic values;
- designated as limited for ORV use, with use limited to designated roads and trails;
- managed as VRM class II;

The Dry Lake Archaeological District ACEC would be designated to protect the information values of paleo-Indian sites thought to be present. Special conditions would be designed to prevent disturbance or damage to the surface which could adversely affect those values. Under alternative F, the ACEC would be

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- open to mineral leasing subject to the special conditions;
- open to disposal of mineral materials;
- open to mineral entry, with plans of operations;
- avoided for right-of-way grants;
- open to land treatments and range improvements subject to special conditions;
- designated as limited for ORV use, with use limited to designated roads and trails.

The Temple Mountain Historic District ACEC and the Tomsich Butte Historic District special emphasis area within the Muddy Creek ACEC would be designated to protect the information values of historic mining use thought to be present. No historic structures would be disturbed until features have been recorded.

Under alternative F, Temple Mountain Historic District ACEC would be
- open to mineral leasing subject to special conditions;
- open to disposal of mineral materials subject to special conditions;
- open to mineral entry, with plans of operations;
- avoided for right-of-way grants;
- excluded from private or commercial use of woodland products, including wood from historic structures, but available for collection of downed dead wood for campfires;
- open to land treatments and range improvements subject to special conditions;
- open to wildlife habitat improvements subject to special conditions;
- designated as limited for ORV use, with use limited to designated roads and trails.

Tomsich Butte Historic District would be managed as a special emphasis area within the Muddy Creek ACEC (discussed under 4333, recreation). In addition to the special conditions for Muddy Creek ACEC given under alternative F, within the special emphasis area no historic structures would be disturbed until features have been recorded.

The following display summarizes cultural resource management actions that would occur under the six alternatives.

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Alternative A		Alternative B		Alternative C		Alternative D		Alternative E		Alternative F	
Do not manage special properties.		Designate and manage 1 ACEC (without limiting livestock or mineral uses).		Designate and manage 4 ACECs (without limiting nonmotorized recreation opportunities or wildlife habitat).		Designate and manage 7 ACECs.		Designate and manage 4 ACECs (without limiting motorized recreation opportunities).		Designate and manage 6 ACECs	
ACEC	acres	ACEC	acres	ACEC	acres	ACEC	acres	ACEC	acres	ACEC	acres
				Dry Lake Archaeological District (Information)	16,990	Dry Lake Archaeological District (Information)	16,990	Dry Lake Archaeological District (Information)	16,990	Dry Lake Archaeological District (Information)	16,990
		I-70 Pictographs (Public Value)	30	I-70 Pictographs (Public Value)	30			I-70 Pictographs (Public Value)	30		
						Pictographs (Public Value)	40			Pictographs (Public Value)	40
				Temple Mountain Historic District (Information)	2,660	Temple Mountain Historic District (Information)	2,660	Temple Mountain Historic District (Information)	2,660	Temple Mountain Historic District (Information)	2,660
				Tomsich Butte Historic District (Information)	2,040	Tomsich Butte Historic District (Information)	2,040	Tomsich Butte Historic District (Information)	2,040	Tomsich Butte Historic District (Information)	2,040
						Little Black Mountain (Conservation)	2,160				
						Copper Globe (Public Value)	220			Copper Globe (Public value)	220
						Swasey Cabin (Public Value)	220			Swasey Cabin (Public Value)	220
Total	0	Total	30	Total	21,720	Total	24,330	Total	21,720	Total	22,170

4332 WILDERNESS MANAGEMENT

Management Common to All Alternatives

SRRA contains one ISA and all or part of seven WSAs, listed in chapter 1 (table 8 and map 10). These areas will be managed under wilderness IMP until Congress either designates them as wilderness or drops them from wilderness review. Actions allowed under IMP will also be subject to restrictions developed in the RMP.

If and when an area is designated as wilderness, that designation will automatically amend this plan. The amendment will be noted and added to the RMP. Designated wilderness will be managed under regulations at 43 CFR 8560. A wilderness management plan will be prepared to provide site-specific management guidance for each designated wilderness area.

Areas not designated as wilderness will remain under IMP until released from wilderness review by Congress. When released, these areas will be managed under guidance for management of other resource programs given in the RMP.

Management Under the Alternatives

The following display shows how each area under wilderness review would be managed under the alternatives if Congress releases it from review without designating it as wilderness.

Wilderness Study Area Number and Name	Acres	Management under the Alternatives					
		A	B	C	D	E	F
ISA, Link Flats	912	IMP	Standard surface use	ACEC 912	ACEC 912	ROS SPM class	Standard surface use
UT-060-007, Muddy Creek	31,400	IMP	Standard surface use	ACEC 27,640	ACEC 13,690	ACEC 13,580	ACEC 13,690
UT-060-023, Sids Mountain Complex	80,530	IMP ACEC 3,950	Standard surface use	ACEC 73,460	ACEC 73,460	ACEC 15,670 N1/2 Crucial bighorn sheep habitat; S1/2 Standard surface use	ACEC 67,680
UT-060-025, Devils Canyon	9,610	IMP	Standard surface use	ACEC 7,520	ACEC 7,520	ACEC 1,620	ACEC 1,620
UT-060-028A, Crack Canyon	25,315	IMP	Standard surface use	ACEC 22,690	ACEC 20 critical watershed	ACEC 20 Crucial bighorn sheep habitat	ACEC 22,640
UT-060-029A, San Rafael Reef	55,540	IMP ACEC 650	ACEC 39,790 standard surface use	ACEC 44,900	ACEC 40,440	ACEC 650 N1/2 Crucial bighorn sheep habitat; S1/2 Standard surface use	ACEC 39,910
UT-060-045, Horseshoe Canyon	20,500	IMP	ACEC, 2,830 standard surface use	ACEC 1,830 P ROS class	ACEC 1,830 critital watershed	ACEC 1,830 Standard surface use	ACEC, 1,830 Critical soils area
UT-060-054, Mexican Mountain	[a]29,000	IMP	Standard surface use	ACEC 25,300	ACEC 25,300	ACEC 25,300	ACEC 16,160
TOTAL	252,807						

NOTE: All areas under wilderness review will be managed under IMP until either designated as wilderness or dropped from review by Congress. Areas designated as wilderness will be dropped from ACEC management where wilderness management adequately protects the values for which the ACEC was established. Acres of ACECs shown under alternatives A through F lie within the boundary of the indicated WSA.

[a] Excludes 30,600 acres in Price River Resource Area. The total acreage in Mexican Mountain WSA is 59,600.

4333 RECREATION MANAGEMENT

Management Common to All Alternatives

Two public land areas, San Rafael Swell and Labyrinth Canyon (map 55), are managed as SRMAs in recognition of intensive recreation use or special recreation values. The remaining public lands are managed as an extensive recreation management area (RMA). An SRMA serves as the basis for preparing an activity plan. A recreation management plan will be developed for each SRMA in the planning area.

Dispersed recreation use will be allowed throughout the planning area, with permits required for commercial use. If demand increases, BLM may require permits for use in other areas where needed to protect resource values; this would not require a plan amendment.

Recreational rockhounding occurs throughout the planning area. No part of the planning area will be designated as closed to rockhounding.

SRRA will continue to manage recreation use of the Green River in conjunction with the Grand Resource Area, Moab District, BLM.

Emery County and the town of Green River propose to establish a scenic loop road along existing vehicle routes in the San Rafael Swell and Desert. Alternatives or improvements to the existing road will be authorized on a case-by-case basis.

In the 1982 Nationwide Rivers Inventory (NRI) [NPS, 1982], NPS lists the Green River and the San Rafael River as potential additions to the National Wild and Scenic Rivers System under the Wild and Scenic Rivers Act. BLM has identified a segment of Muddy Creek in SRRA as having potential for wild and scenic designation. These river segments are shown on map 56. Designation to the National Wild and Scenic Rivers System would be made by Congress and would amend this plan.

Interim management of the three river segments (appendix J) will serve to protect the identified values until Congress acts. NEPA documents prepared for any proposals for use of the study segments will take these values into account and provide mitigation for potentially adverse impacts. Actions allowed under interim management will also be subject to restrictions developed in the RMP.

Management Under the Alternatives

Temple Mountain Bike Trail

A cooperative management agreement between BLM and Pathfinders Motorcycle Club, Inc. of Price, Utah in 1986 provided for joint development and management of a system of motorcycle trails within the swell in the Temple Mountain Vicinity (map 57). BLM has cooperated with the Utah Division of Parks & Recreation to manage the Goblin Valley Trail Rides, an annual event.

Alternative E. The Temple Mountain Bike Trail (1,900 acres) would be managed to protect motorized recreational opportunities. Under alternative E, the area would be

- closed to mineral leasing;
- closed for disposal of mineral materials;
- withdrawn from mineral entry;
- excluded from right-of-way grants;
- excluded from livestock use;
- excluded from land treatments and range improvements;
- excluded from private or commercial use of woodland products, except for collection of live or downed dead wood for campfires.

Developed Recreation Sites

BLM will continue to manage the following recreation sites: San Rafael Campground, Buckhorn Pictographs, Cattleguard Pictographs, and Swasey Cabin Historic Site (map 57). Consistent with the goal of each alternative, recreation facilities on developed recreation sites would be protected to the greatest extent possible or moved to a different location.

Alternative A. Existing developed recreation sites would be

- open for mineral leasing with special conditions to prevent surface occupancy;

- closed to livestock use;
- excluded from private or commercial use of woodland products, including collection of live or downed dead wood for campfires;
- excluded from land treatments and range improvements, except for development of watershed control structures where necessary to protect recreation sites.

Alternatives B, C, D, E, and F. Three new recreation sites (20 acres each, map 57) would be developed: The Wedge Overlook, Justensen Flats Campground, and Tomsich Butte Campground. Developed campsites would include picnic tables, fire rings, and rest rooms. Developed recreation sites would be
- closed to mineral leasing;
- closed to disposal of mineral materials;
- withdrawn from mineral entry;
- excluded from right-of-way grants;
- excluded from private or commercial use of woodland products, including collection of live or downed dead wood for campfires;
- excluded from livestock use;
- excluded from land treatment and range improvements, except for development of watershed control structures where necessary to protect the recreation sites;
- designated as limited for ORV use, with use limited to designated roads and trails;
- managed as VRM class II.

Recreation Opportunity Spectrum Classes

ROS classes have been identified based on inventory work (map 58). Classes are based on five setting factors (appendix K). These factors are reviewed periodically; a change in conditions could result in a change in ROS class. However, RMP special conditions (if any) developed to protect specific ROS class areas reflect conditions present when the RMP was prepared and may be changed only through a plan amendment.

Management restrictions are not necessary to maintain ROS class areas toward the urban end of the spectrum, including roaded natural (RN), rural (R), and urban (U). Under alternatives A, B, and F, therefore, no attempt would be made to manage for specific ROS class areas.

Alternative C. A total of 763,260 acres would be managed for recreation opportunities at the primitive end of the spectrum.

SPM class areas (593,880 acres) would be managed to provide a predominantly natural landscape where evidence of human use is subtle. Special conditions for SPM class areas subject to surface disturbance would be revegetated to blend with surrounding conditions within 2 years of project completion and may require new access routes to be reclaimed or to remain open for improved recreation access, as determined on a case-by-case basis. Actions may be taken to maintain user concentrations at low levels. Under alternative C, SPM class areas would be
- open to mineral leasing, with special conditions;
- open for disposal of mineral materials with special conditions;
- open to mineral entry, with plans of operations;
- avoided for right-of-way grants;
- excluded from private or commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- excluded from grazing use during the spring and fall;
- excluded for land treatment and range improvements, except for wildlife habitat improvements;
- designated as limited for ORV use, with use limited to designated roads and trails;
- managed as VRM class II.

Semiprimitive nonmotorized (SPNM) class areas (153,530 acres) would be managed so as to provide a predominantly natural landscape where evidence of human use is limited. SPNM class areas subject to surface disturbance would be revegetated to blend with surrounding conditions within 2 years of project completion (except for wildlife habitat improvements). New access routes would be reclaimed. Actions may be taken to limit use levels to maintain an environment of isolation (not more than 10 encounters per day) or to maintain natural ecosystems. Under alternative C, SPNM class areas would be
- closed to mineral leasing;
- closed to disposal of mineral materials;
- withdrawn from mineral entry;
- excluded from right-of-way grants;
- excluded from private or commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;

- excluded from grazing use during the spring and fall;
- excluded from land treatment and range improvements except for wildlife habitat improvements;
- designated as closed to ORV use;
- managed as VRM class I;
- subject to conditional fire suppression, with motorized suppression methods used only if necessary to protect life or property, and with reclamation to meet special conditions.

P class areas (15,850 acres) would be managed to be essentially free of evidence of human use. P class areas subject to surface disturbance would be revegetated to blend with surrounding conditions within 1 year of project completion (except for wildlife habitat improvements). New access routes would be reclaimed. Actions may be taken to limit use levels to maintain an environment of isolation (not more than 6 encounters per day) or to maintain natural ecosystems. Under alternative C, P class areas would be

- closed to mineral leasing;
- closed to disposal of mineral materials;
- withdrawn from mineral entry;
- excluded from right-of-way grants;
- excluded from private or commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- excluded from grazing use during the spring and fall;
- excluded from land treatments and range improvements except for wildlife habitat improvements where P class values would be maintained or improved;
- designated as closed to ORV use;
- managed as VRM class I;
- subject to conditional fire suppression, with motorized suppression methods used only if necessary to protect life or property, and with reclamation to meet special conditions.

Alternative D. A total of 63,760 acres would be managed for recreation opportunities at the primitive end of the spectrum.

SPNM class areas (48,050 acres) and P class areas (15,710 acres) would be managed to provide a predominantly natural landscape where evidence of human use is limited. Such management would minimize surface disturbance of the watershed and protect cultural resource values, while allowing watershed control structures where necessary. SPNM class areas subject to surface disturbance would be revegetated to blend with surrounding conditions within 1 year of project completion. New access routes would be reclaimed. Actions may be taken to limit use levels to maintain an environment of isolation (not more than 10 encounters per day) or to maintain natural ecosystems. Under alternative D, SPNM class areas and P class areas would be

- closed to mineral leasing;
- closed to disposal of mineral materials;
- withdrawn from mineral entry;
- excluded from right-of-way grants;
- excluded from private or commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- available for land treatment, livestock related range improvements, and wildlife habitat improvements only if necessary to maintain active preference and adequate distribution of livestock;
- available for watershed control structures;
- designated as closed to ORV use;
- managed as VRM class I;
- subject to conditional fire suppression, with motorized suppression methods used only if necessary to protect life or property, and with reclamation to meet special conditions.

Alternative E. A total of 700,520 acres would be managed for SPM class recreation opportunities.

SPM class areas would be managed to provide a predominantly natural landscape where evidence of human use is subtle. Such management would protect values incidental to motorized recreation opportunities. Special conditions for SPM class areas subject to surface disturbance would be revegetated to blend with surrounding conditions within 2 years of project completion and may require new access routes to be reclaimed or remain open for improved recreation access, as determined on a case-by-case basis. Actions may be taken to maintain user concentrations at low levels. Under alternative E, SPM class areas would be

- open to mineral leasing with special conditions;
- open to disposal of mineral materials with special conditions;

- avoided for right-of-way grants;
- excluded from private or commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- excluded from grazing use during spring and fall;
- managed as VRM class II;
- subject to conditional fire suppression, and with reclamation to meet special conditions.

Off-Road Vehicle Use Designations

ORV use designations developed in the RMP will be made following completion of an ORV implementation plan (appendix L). Criteria will be developed to determine the specific course of action needed to implement the ORV allocation decision. ORV designations do not apply to state, county or BLM system roads, or to private or state inholdings. An assessment will be made to determine a purpose and need for public land non-system roads. Public participation will be encouraged to assist BLM in identifying which non-system roads should be designated as open. The implementation plan will become effective following publication of a Federal Register notice after the RMP is complete.

The ORV designations do not distinguish between recreational and nonrecreational use; ORV use in an area designated closed or limited may be allowed under an authorized permit. ORV designations can be changed only through a plan amendment.

ORV designations under alternatives B, C, D, E, and F (maps 59, 60, 61, 62, and 63) would be made for several different purposes, according to the goal of the specific alternative. ORV use designations under the alternatives, along with the resource values that would be protected, are listed here.

Alternative A	Acres	Total
Open to ORV use		1,539,190

Alternative B	Acres	Total
Limited to existing roads and trails		1,493,230
to protect range values	1,491,450	
to protect existing land leases	1,780	

Alternative B (Concluded)	Acres	Total
Limited to designated roads and trails		43,940
to protect developed recreation sites	40	
to protect ACECs	43,900	
Closed to ORV use		2,020
to protect ACECs	2,020	

Alternative C	Acres	Total
Open to ORV use		194,640
Open to ORV use with seasonal restrictions		246,700
to protect crucial wildlife habitat:		
-bighorn sheep lambing areas (03/16 to 04/01) and rutting areas (10/16 to 01/31)	24,400	
-antelope fawning area (05/15 to 07/15)	129,500	
-deer and elk winter range (12/14 to 04/30)	92,800	
Limited to designated roads and trails		606,110
to protect existing land leases	1,690	
to protect recreation values		
-developed recreation sites	70	
-ROS class areas	593,810	
to protect riparian and aquatic habitat	10,540	
Closed to ORV Use		491,740
to protect recreation values		
-ROS P class areas	15,850	
-ROS SPNM class areas	153,530	
to protect ACECs	320,540	

Alternative D	Acres	Total
Open to ORV use		172,360
Open to ORV use with seasonal restrictions		84,770
to protect crucial wildlife habitat:		
-bighorn sheep lambing areas (03/16 to 04/01) and rutting areas (10/16 to 01/31)	13,260	
-antelope fawning area (05/15 to 07/15)	63,450	
-deer and elk winter range (12/14 to 04/30	11,540	

Alternative D (Concluded)	Acres	Total
Limited to designated roads and trails		840
to protect existing land leases	800	
to protect recreation values		
-developed recreation sites	40	
Closed to ORV use		1,281,220
to protect recreation values		
-ROS P class areas	15,710	
-ROS SPNM class areas	48,050	
to protect riparian and aquatic habitat	1,600	
to protect ACECs	300,080	
to protect critical watersheds	915,780	

Alternative E	Acres	Total
Open to ORV use		1,380,870
Limited to existing roads and trails		156,910
to protect ACECs	156,910	
Limited to designated roads and trails		1,410
to protect existing land leases	1,340	
to protect developed recreation sites	70	

Alternative F	Acres	Total
Open to ORV use		761,820
Open to ORV use with seasonal restrictions		61,060
to protect crucial wildlife habitat:		
-bighorn sheep lambing areas (03/16 to 04/01) and rutting areas (10/16 to 01/31)	31,580	
-deer and elk winter range (12/14 to 04/30)	29,480	
Limited to designated roads and trails		711,840
to protect existing land leases	1,780	
to protect developed recreation sites	70	
to protect riparian and aquatic habitat	7,180	
to protect ACECs	269,600	
to protect critical soils	433,210	
Closed to ORV use		4,470
to protect ACECs	4,470	

The following display summarizes recreation management actions that would occur under the six alternatives.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Continue present management of RMAs and existing developed recreation sites.	Manage RMAs and developed recreation sites so that livestock and mineral uses are not limited.	Manage RMAs and developed recreation sites so nonmotorized recreation opportunities and wildlife habitat uses are not limited.	Manage RMAs and developed recreation sites so that watershed and cultural resources are protected.	Manage RMAs and developed recreation sites so that motorized recreation opportunities are not limited.	Manage designated RMAs and developed recreation sites, limiting livestock and mineral uses on sites; and develop recreation facilities on designated sites.
Develop campgrounds (None) 0	Develop campgrounds (None) 0	Develop campgrounds The Wedge 20 Justensen Flats 20 Tomsich Butte 20	Develop campgrounds (None) 0	Develop campgrounds The Wedge 20 Justensen Flats 20 Tomsich Butte 20	Develop campgrounds The Wedge 20 Justensen Flats 20 Tomsich Butte 20
Do not manage for specific ROS classes.	Do not manage for specific ROS classes.	Manage lands to increase areas available for P and SPNM opportunities.	Manage for specific ROS classes in designated areas.	Manage lands to increase areas available for SPM and RN opportunities.	Do not manage lands for specific ROS classes.
ROS class total SRRA 0 FPU 0 Total 0	ROS class total SRRA 0 FPU 0 Total 0	ROS class total SRRA 748,210 FPU 15,050 Total 763,260	ROS class total SRRA 63,760 FPU 0 Total 63,760	ROS class total SRRA 656,950 FPU 43,570 Total 700,520	ROS class total SRRA 0 FPU 0 Total 0
P class area SRRA 0 FPU 0 Total 0	P class area SRRA 0 FPU 0 Total 0	P class area SRRA 15,850 FPU 0 Total 15,850	P class area SRRA 15,710 FPU 0 Total 15,710	P class area SRRA 0 FPU 0 Total 0	P class area SRRA 0 FPU 0 Total 0
SPNM class area SRRA 0 FPU 0 Total 0	SPNM class area SRRA 0 FPU 0 Total 0	SPNM class area SRRA 153,530 FPU 0 Total 153,530	SPNM class area SRRA 48,050 FPU 0 Total 48,050	SPNM class area SRRA 0 FPU 0 Total 0	SPNM class area SRRA 0 FPU 0 Total 0

(Continued)

SPM class area						
SRRA	0	0	578,830	0	656,950	0
FPU	0	0	15,050	0	43,570	0
Total	0	0	593,880	0	700,520	0
	Continue to leave all areas open to ORV use.	Designate all areas as open to ORV use unless limited to protect livestock.	Designate areas as open to ORV use only where nonmotorized recreation opportunities or wildlife habitat uses would not be limited.	Designate areas as open to ORV use only where watershed or cultural resources management would not be limited.	Designate all areas as open to ORV use unless limited to protect motorized recreation opportunities (scenic values).	Designate specific areas as open to ORV use, open with seasonal restrictions, limited to designated roads and trails, or closed to ORV use.
Open to ORV use						
SRRA	1,463,840	0	182,380	168,540	1,307,720	711,680
FPU	75,350	0	12,260	3,820	72,650	50,140
Total	1,539,190	0	194,640	172,360	1,380,370	761,820
Open with seasonal restrictions						
SRRA	0	0	203,480	77,170	0	44,530
FPU	0	0	43,220	7,600	0	16,530
Total	0	0	246,700	84,770	0	61,060
Limited to existing roads & trails						
SRRA	0	1,417,880	0	0	154,210	0
FPU	0	75,350	0	0	2,700	0
Total	0	1,493,230	0	0	156,910	0
Limited to designated roads & trails						
SRRA	0	43,940	588,940	840	1,410	703,140
FPU	0	0	17,170	0	0	8,700
Total	0	43,940	606,110	840	1,410	711,840
Closed to ORV use						
SRRA	0	2,020	489,040	1,217,290	0	4,470
FPU	0	0	2,700	63,930	0	0
Total	0	2,020	491,740	1,281,220	0	4,470

4333 VISUAL RESOURCE MANAGEMENT

Management Common to All Alternatives

VRM class areas on public lands in the planning area have been identified based on inventory work. Classes are based on visual resource conditions, such as scenic quality, distance zones, and sensitivity levels (appendix M). These are reviewed periodically; a change in conditions could cause a change in VRM class.

VRM classes give management objectives to be applied to actions taking place on public lands. Land use proposals are reviewed individually to determine whether visual impacts can be adequately mitigated to meet the objective of the existing VRM class.

Visual values and projects will be evaluated to determine appropriate management and conform with VRM class objectives on a case-by-case basis.

Management Under the Alternatives

With differing levels of emphasis on production or protection of other resources, the acreage in each VRM class would vary by alternative. VRM designations, by alternative, are shown on maps 64, 65, 66, 67, and 68.

Special Management Designations

Under alternatives A, C, D, E, and F, certain areas would be designated as ACECs to protect visual resources. No such designation is identified under alternative B. The areas that would be designated under each alternative, along with the special management conditions that would apply to the specific ACECs under that alternative, are shown here.

Alternative A

The I-70 Scenic Corridor ACEC (52,150 acres, within both SRRA and FPU), would be designated as an ACEC to protect scenic values. The area was identified for special management in both existing MFPs [BLM, 1977a; BLM, 1979a], both of which predate current ACEC policy. Although the corridor has not been formally designated as an ACEC, it is considered as such here for comparison of alternatives (map 11). Under alternative A, the I-70 Scenic Corridor ACEC would be

- closed to oil and gas leasing in the vicinity of San Rafael Reef, south of Mexican Mountain, south of Sids Mountain, north of Cat Canyon, and north Muddy Creek; in the remainder of the area (and for other types of mineral leasing throughout the area), open for mineral leasing with special conditions to prevent surface occupancy;
- open to disposal of mineral materials with special conditions;
- open to mineral entry with plans of operations;
- avoided for right-of-way grants;
- excluded from private and commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- managed as VRM classes II, III, and IV.

Alternative C

The I-70 Scenic Corridor (52,150 acres), Muddy Creek (22,540 acres), San Rafael Canyon (58,510 acres), San Rafael Reef (67,520 acres), Segers Hole (7,120 acres), Sids Mountain (89,060 acres), and Gilson Buttes (1,750 acres) ACECs, within both SRRA and FPU, would cover a total of 298,650 acres (map 13). Under alternative C, all seven scenic quality ACECs would be managed under the special conditions given earlier for ROS P class areas (see 4333, recreation).

Alternative D

The I-70 Scenic Corridor (52,130 acres), Muddy Creek (22,540 acres), San Rafael Canyon (58,510 acres), San Rafael Reef (43,870 acres), Segers Hole (7,120 acres), Sids Mountain (89,060 acres), and Gilson Buttes (1,750 acres) ACECs, within both SRRA and FPU, would cover a total of 274,980 acres (map 14). Under alternative D, all seven scenic quality ACECs would be

- closed to mineral leasing;
- closed to disposal of mineral materials;
- withdrawn from mineral entry;

- excluded from right-of-way grants;
- excluded from private and commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- excluded from land treatments;
- closed to ORV use;
- managed as VRM class I;
- subject to fire suppression methods that exclude motorized earth-moving equipment.

Alternative E

The I-70 Scenic Corridor (52,150 acres), Muddy Creek (22,540 acres), and San Rafael Canyon (58,510 acres), within both SRRA and FPU, would cover a total of 133,200 acres (map 15). Under alternative E, all three scenic quality ACECs would be
- open for mineral leasing with special conditions to prevent surface occupancy;
- closed to disposal of mineral materials;
- open to mineral entry, with plans of operation;
- avoided for right-of-way grants;
- excluded from private and commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- excluded from land treatments;
- designated as limited for ORV use, with use limited to existing roads and trails;
- managed as VRM class I;
- subject to conditional fire suppression, with motorized suppression methods used only if necessary to protect life or property, and with reclamation to meet special conditions.

Alternative F

The I-70 Scenic Corridor (52,130 acres), Muddy Creek (22,540 acres, including Tomsich Butte Historic District special emphasis area), San Rafael Canyon (35,240 acres), San Rafael Reef (68,720 acres), Segers Hole (7,120 acres), and Sids Mountain (61,870 acres) ACECs, within both SRRA and FPU, would cover a total of 247,620 acres (map 16). No-surface-occupancy stipulations may be waived in areas managed for scenic values if an EA concludes that the proposed action would not adversely impact scenic values.

Under alternative F, the I-70 scenic corridor, Muddy Creek, upper and lower San Rafael Canyon, San Rafael Reef, Segers Hole, and Sids Mountain ACECs would be
- open to mineral leasing with special conditions to prevent surface occupancy;
- closed to disposal of mineral materials;
- open to mineral entry, with plans of operations, not the original Sids ACEC;
- avoided for right-of-way grants;
- open to range improvements with special conditions;
- excluded from land treatments;
- designated as limited for ORV use, with use limited to designated roads and trails;
- managed as VRM class I;
- excluded from private and commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- subject to conditional fire suppression, with motorized suppression methods used only if necessary to protect life or property, and meet special conditions.

The central portion of the San Rafael Canyon ACEC, which includes The Wedge area and the river canyon from Johansen Cabin to Lockhart Wash (11,000 acres), would be protected to maintain VRM class II values by controlling surface disturbance. Under alternative F, the area would be
- open to mineral leasing subject to special conditions;
- open to disposal of mineral materials with special conditions;
- open to mineral entry, with plans of operations;
- avoided for right-of-way grants;
- excluded from private or commercial use of woodland products, except for collection of live or downed dead wood for campfires.
- excluded from livestock grazing within Buckhorn Canyon;
- excluded from land treatment and range improvements unless used to protect or improve riparian values;
- designated as limited for ORV use, with use limited to designated roads and trails;
- managed as VRM class II.

The following display summarizes VRM actions that would occur under the six alternatives.

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
	Maintain MFP objectives for managing visual values and provide project design standards on a case-by-case basis.	Establish objectives for managing visual values and provide design standards that do not limit livestock or mineral uses.	Establish objectives for managing visual values and provide design standards that do not limit nonmotorized recreation opportunities and wildlife habitat.	Establish objectives for managing visual values and provide design standards that do not limit watershed and cultural resources.	Establish objectives for managing visual values and provide design standards that protect motorized recreation opportunities.	Establish objectives for managing visual values and provide design standards that protect or enhance designated VRM classes.
Class I	acres	acres	acres	acres	acres	acres
SRRA	0	0	469,430	427,750	133,030	229,050
FPU	0	0	2,700	2,700	2,700	2,700
Total	0	0	472,130	430,450	135,730	231,750
Class II	acres	acres	acres	acres	acres	acres
SRRA	492,230	492,230	681,540	166,780	915,210	286,800
FPU	4,140	4,140	44,400	1,440	44,400	1,440
Total	496,370	496,370	725,940	168,220	959,610	288,240
Class III	acres	acres	acres	acres	acres	acres
SRRA	378,230	378,230	163,610	340,500	196,350	359,000
FPU	5,040	5,040	3,240	5,040	3,240	5,040
Total	383,270	383,270	166,850	345,540	199,590	364,040
Class IV	acres	acres	acres	acres	acres	acres
SRRA	593,380	593,380	149,260	528,810	219,250	588,990
FPU	66,170	66,170	25,010	66,170	25,010	66,170
Total	659,550	659,550	174,270	594,980	244,260	655,160
TOTAL	1,539,190	1,539,190	1,539,190	1,539,190	1,539,190	1,539,190

(Continued)

Designate ACECs	acres	Designate ACECs	acres	Designate ACECs	acres	Designate ACECs	acres	Designate ACECs	acres	Designate ACECs	acres
SRRA (1)	49,450	SRRA (0)	0	SRRA (7)	295,950	SRRA (7)	272,280	SRRA (3)	130,500	SRRA (6)	244,920
I-70 Scenic Corridor	49,450			I-70 Scenic Corridor	49,450	I-70 Scenic Corridor	49,430	I-70 Scenic Corridor	49,450	I-70 Scenic Corridor	49,430
				Muddy Creek	22,540	Muddy Creek	22,540	Muddy Creek	22,540	Muddy Creek	22,540
				San Rafael Canyon	58,510	San Rafael Canyon	58,510	San Rafael Canyon	58,510	San Rafael Canyon	35,240
				San Rafael Reef	67,520	San Rafael Reef	43,870			San Rafael Reef	68,720
				Segers Hole	7,120	Segers Hole	7,120			Segers Hole	7,120
				Sids Mountain	89,060	Sids Mountain	89,060			Sids Mountain	61,870
				Gilson Buttes	1,750	Gilson Buttes	1,750				
FPU (1)	2,700	FPU (0)	0	FPU (1)	2,700	FPU (1)	2,700	FPU (1)	2,700	FPU (1)	2,700
I-70 Scenic Corridor	2,700			I-70 Scenic Corridor	2,700	I-70 Scenic Corridor	2,700	I-70 Scenic Corridor	2,700	I-70 Scenic Corridor	2,700
Total (1)	52,150	Total	0	Total	298,650	Total	274,980	Total	133,200	Total	247,620

4341 SOIL, WATER, AND AIR MANAGEMENT

Management Common to All Alternatives

BLM will manage actions on the public lands to protect the soil resource and municipal watersheds. Additionally, BLM will manage the soil resource to maintain or increase soil productivity, prevent or minimize accelerated soil erosion, and prevent or minimize flood and sediment damage, as needed.

Areas with critical or special soil needs (map 69) have been identified based on unpublished Emery area and Henry Mountain area Soil Conservation Service (SCS) soil surveys (maps 69 and 70). Additional inventories could determine the existence of additional special areas or change the location or extent of areas previously identified.

BLM will maintain the soil data base by updating range site descriptions from information collected through range monitoring and other specific studies and share information with SCS. BLM will determine the existence of prime and unique farmlands (based on SCS criteria) prior to approval of any actions.

Soil productivity and vegetation cover will be maintained at or above the threshold necessary to avoid exceeding the soil loss tolerance for critical soils (appendix N).

Watershed condition and water quality will be maintained or improved. Watershed control structures in place prior to the RMP will be maintained.

Water quality improvements will be implemented in areas that do not meet state water quality standards. Specific actions will be determined through activity-level plans prepared after completion of the RMP. Improvements may include limitations on grazing to maintain water quality within state standards, actions to allow increased vegetation cover, stabilization of soils where erosion and leaching of natural salts have decreased water quality, limitations on surface-disturbing activities to prevent deterioration of water quality, rehabilitation of abandoned roads and mine tailings, restrictions on placement of erodible material, cooperation with surface users to reduce surface disturbance, and restriction of ORV use on erodible or steep slopes.

BLM will continue to cooperate with the Bureau of Reclamation (BOR) and SCS on salinity control projects.

Floodplains are managed in accordance with Executive Order 11988. Surface occupancy of floodplains and flood hazard areas will be allowed only where precautions are taken to prevent loss of property or human life. Floodplains will be excluded from construction of permanent structural improvements, except for fences, bridges, and watershed control structures unless no other practical alternative is available.

BLM will monitor existing water quality and watershed conditions and identify watersheds that contribute high salt and sediment loads to the Colorado River Basin. Water quality data have been entered on the U.S. Geological Survey (USGS) STORET computer data base program and will be maintained. BLM will take appropriate actions to maintain water quality of streams within the planning area to meet state and federal water quality standards, including designated beneficial uses and antidegradation requirements. BLM will also maintain a water quantity data base.

BLM will maintain in-house water rights files and a water rights data base on the statewide computer system. BLM has participated in four water rights adjudication proceedings in cooperation with the Utah State Division of Water Rights and will continue to cooperate with the state as updates are made. BLM will continue to obtain new water rights to benefit resource activities.

BLM will maintain a water quantity data base and take appropriate actions to maintain water quality of streams within the planning area to meet state and federal water quality standards, including designated beneficial uses and antidegradation requirements.

Floodplains improve bank storage potential, which, in turn, makes more moisture available for riparian vegetation. BLM will protect and preserve riparian areas to benefit the following natural functions:

(1) dissipating stream energy associated with high flows, which reduces erosive forces, allows sediment deposition, and aids in alluvial valley floor and floodplain development;

(2) developing root masses that stabilize stream banks against cutting action;

(3) providing a filter against overland flows that carry sediment and other pollutants;

(4) regulating sunlight on the stream surface which, in turn, regulates the water temperature; and

(5) raising the ground water table.

BLM will manage actions on public lands to meet air quality standards prescribed by federal, state, and local laws and will protect existing air quality when feasible. The unique visual (air quality) characteristics of four special interest areas (Mexican Mountain, San Rafael Reef, Sids Mountain, and the lower Green River) will be maintained; potential adverse impacts will be mitigated through site-specific NEPA documents prepared at the time an action in this area is proposed and through best available control technology as part of the state permitting process and any prevention of significant deterioration (PSD) review.

BLM will negotiate with the State of Utah on management of smoke from prescribed fires that could impact class I areas. The mechanism for this negotiation is being established (April 1988) through a memorandum of understanding among BLM, USFS, and the State of Utah.

Management Under the Alternatives

With differing levels of emphasis on production or protection of other resources, the acreage available improvement of watershed conditions or installation of watershed control structures would vary by alternative. Special management designations would be applied to certain areas under alternatives D and F.

Special Management Designations

Alternative D

A total of 915,820 acres would be designated as critical watersheds to protect areas subject to severe wind and water erosion, frequent flooding, and high runoff areas which have a potential for loss of vegetation when disturbed and saline soils. Critical watershed areas would be managed for the least possible surface disturbance. Under alternative D, critical watershed areas would be

- closed to mineral leasing;
- closed to disposal of mineral materials;
- withdrawn from mineral entry;
- excluded from right-of-way grants;
- excluded from private and commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- excluded from grazing in riparian and aquatic areas; in allotments containing critical watershed areas; AUMs would be reduced to 50 percent of existing use;
- excluded from spring grazing;
- available for land treatments or range improvements only where critical watershed, riparian or aquatic values would be maintained or improved;
- closed to ORV use.

Alternative F

A total of 574,320 acres would be designated as critical soils areas to protect soils that are either highly saline or highly susceptible to water erosion. Critical soils areas would be managed to maintain vegetation cover at or above the level necessary to avoid exceeding SCS critical soil loss threshold (appendix N). Management decisions would be based on all data available at that time. Under alternative F, critical soils areas would be

- open to mineral leasing subject to special conditions;
- open to disposal of mineral materials subject to special conditions;
- avoided for right-of-way grants;
- available for land treatments and range improvements where critical soil conditions would be maintained or improved;
- designated as limited for ORV use, with use limited to designated roads and trails;
- subject to conditional fire suppression, with motorized suppression methods used only if necessary to protect life or property, and with reclamation to meet special conditions.

The following display summarizes soil, water, and air management actions that would occur under the six alternatives.

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Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Maintain soil productivity.	Maintain soil productivity.	Maintain soil productivity where nonmotorized recreation opportunities and wildlife uses are not limited.	Attain maximum soil productivity. Manage critical watershed areas to minimize surface disturbance.	Maintain soil productivity where motorized recreation opportunities are not limited.	Maintain soil productivity by adjusting livestock season of use; develop and implement management plans.
Consider developing watershed management plans acres	Consider developing watershed management plans acres	Consider developing watershed management plans acres	Consider developing watershed management plans acres	Consider developing watershed management plans acres	Consider developing watershed management plans acres
SRRA 1,463,840	SRRA 1,459,820	SRRA 395,060	SRRA 1,463,840	SRRA 1,440,130	SRRA 1,446,850
FPU 75,350	FPU 75,350	FPU 57,600	FPU 75,350	FPU 75,350	FPU 75,350
Total 1,539,190	Total 1,535,170	Total 452,660	Total 1,539,190	Total 1,515,480	Total 1,522,200
Maintain or improve watershed condition and water quality.	Maintain or improve watershed condition and water quality where livestock and mineral uses are not limited.	Maintain or improve watershed condition and water quality where nonmotorized recreation opportunities and wildlife uses are not limited.	Improve watershed condition and water quality in all areas.	Maintain or improve watershed condition and water quality where motorized recreation opportunities are not limited.	Maintain or improve watershed condition and water quality by adjusting livestock season of use; develop implement management plans; construct watershed control structures.
Acres available	Acres available	Acres available	Acres available	Acres available	Acres available
SRRA 1,463,840	SRRA 1,459,820	SRRA 395,060	SRRA 1,463,840	SRRA 1,440,130	SRRA 1,446,850
FPU 75,350	FPU 75,350	FPU 57,060	FPU 75,350	FPU 75,350	FPU 75,350
Total 1,539,190	Total 1,535,170	Total 452,660	Total 1,539,190	Total 1,515,480	Total 1,522,200
Acres Excluded	Acres Excluded	Acres Excluded	Acres Excluded	Acres Excluded	Acres Excluded
SRRA 0	SRRA 4,020	SRRA 1,068,780	SRRA 0	SRRA 23,710	SRRA 16,990
FPU 0	FPU 0	FPU 17,750	FPU 0	FPU 0	FPU 0
Total 0	Total 4,020	Total 1,086,530	Total 0	Total 23,710	Total 16,990

4342 HAZARDOUS WASTE MANAGEMENT

Management Common to All Alternatives

BLM will manage actions on public lands to (1) protect the health and safety of the public, federal land users, and BLM employees; (2) comply with applicable federal and state laws, rules, and orders, within the context of BLM's statutory mission as a federal natural resource manager; and (3) clean up past problems, control current problems, and avoid or minimize future problems of hazardous materials on public lands in a cost-effective manner. At this time (1988), BLM policy regarding hazardous materials management is still being formulated.

Under all six alternatives, BLM would identify active and abandoned hazardous materials sites, if present, on a case-by-case basis and determine if further assessment of potentially hazardous materials is needed.

4351 HABITAT MANAGEMENT

Management Common to All Alternatives

Wildlife habitats within the planning area will be managed to provide for a diversity of species. Specific habitat areas will be managed to provide forage, cover, water, and space requirements to support major wildlife species.

BLM will continue to manage big game species habitat (maps 71, 72, 73, and 74) and recommend population levels to the Board of Big Game Control. BLM will continue to cooperate with UDWR on interagency big game studies to monitor habitat conditions. UDWR has identified seasonal and crucial habitat areas with input from federal agencies, including BLM. These areas could change over time as animal populations and habitat conditions change.

BLM will continue to cooperate with UDWR and other federal agencies to identify herd units, crucial habitat areas, and hunting and trapping areas and to control predators.

Riparian and aquatic habitats (maps 75 and 76) will be managed to preserve, protect, and restore natural functions in accordance with laws, executive orders, and regulations as they relate to habitat management. Inventories will be initiated to determine the condition and affecting elements of riparian habitat.

Known raptor sites will be protected from human disturbance to the greatest extent possible. All permitted activities within 0.5 mile of an active nest site would be restricted during the nesting season (February 15 to June 15 annually). These sites may vary in location from year to year and have not been mapped for this RMP.

BLM will work in cooperation with UDWR to maintain or re-establish desert bighorn sheep within identified habitat areas, so long as this practice is in keeping with RMP goals and objectives. Transplants of native big game species may take place within habitat areas if identified in an HMP prepared or modified after completion of the RMP; these actions would not require a plan amendment. HMPs will be coordinated with affected land owners. Transplants of fish and game birds may take place without requiring an HMP or a plan amendment.

Management Under the Alternatives

With differing levels of emphasis on production or protection of other resources, the acreage available for wildlife habitat management would vary by alternative. Livestock use on crucial big game range would continue with adjusted forage use levels being made at the activity plan level or in conjunction with grazing decisions to be issued following completion of 5 years of monitoring.

Protection of Crucial Habitat Areas

Certain crucial habitat areas would be given special protection under alternatives A, C, D, E, and F.

Alternative A

Mule Deer and Elk Winter Range. Activities within 97,500 acres (maps 73 and 74) would be limited during periods of critical winter use (when animals are actually present, generally December 15 to April 30 annually). During this period, no surface-disturbing activity may take place which would remove forage and browse plants used by the mule deer or elk, require a continued human presence (over 12 hours duration) within the area, involve sudden loud noises (such as detonation of surface charges), or sustained noise (such as chain saw or diesel generator). Hunting during a recognized hunting season in an official hunting area, as established by UDWR, would not be affected. Mule deer and elk winter range would be managed with special conditions to protect winter range values for deer and elk use. Under alternative A, mule deer and elk winter range would be

- open to mineral leasing with special conditions;
- open to disposal of mineral materials with special conditions;
- open to mineral entry with special conditions where plans of operations are required;
- open to private or commercial use of woodland products with special conditions;
- open to land treatments and range improvements with special conditions;
- closed to ORV use during the seasonal restriction period.

Offsite Mitigation, Big Game Habitat. On the 97,500 acres identified above (maps 73 and 74), when unreclaimed disturbance caused by a user totals more than 10 acres in 2 years, offsite mitigation would be required within the mule deer and elk winter range. This would be in addition to standard reclamation requirements.

The offsite mitigation must be within the known habitat area but it does not have to be within the crucial habitat area. Offsite mitigation could include such measures as seedings or planting vegetation species favorable to the big game animals displaced or constructing water projects that would allow the animals to use other parts of the habitat area. Offsite mitigation projects must be approved in advance by the authorized officer.

Alternative B

No special conditions would be applied to protect wildlife habitat under alternative B.

Alternative C

Desert Bighorn Sheep. Activities within 200,000 acres (map 71, SRRA only) would be limited during the lambing and rutting seasons (April 15 to June 1 and October 16 to January 31 annually). During these periods, no activities may take place which require a continued human presence (over 12 hours duration) within the area or involve sudden loud noises (such as detonation of surface charges) or sustained noise (such as chain saw or diesel generator). Desert bighorn sheep area would be managed with special conditions to protect the habitat from deterioration and the animals from interference with lambing and rutting. Under alternative C, desert bighorn sheep habitat would be

- open to mineral leasing with special conditions;
- open to disposal of mineral materials with special conditions;
- open to mineral entry with special conditions where plans of operations are required;
- avoided for right-of-way grants;
- open to private or commercial use of woodland products with special conditions;
- open to land treatments and range improvements with special conditions;
- closed to ORV use during the seasonal restriction periods.

Antelope Habitat. Activities within 507,000 acres (map 72, SRRA only) would be limited during the lambing and rutting seasons (April 15 to June 1 and October 16 to January 31 annually). During these periods, no activities may take place which require a continued human presence (over 12 hours duration) within the area or involve sudden loud noises (such as detonation of surface charges) or sustained noise (such as chain saw or diesel generator). Antelope habitat would be managed with special conditions to protect it for antelope use. Under alternative C, antelope habitat would be

- open to mineral leasing with special conditions;

- open to disposal of mineral materials with special conditions;
- open to mineral entry with special conditions where plans of operations are required;
- avoided for right-of-way grants;
- open to private or commercial use of woodland products with special conditions;
- open to land treatments and range improvements with special conditions;
- closed to ORV use during the seasonal restriction periods.

Mule Deer and Elk Winter Range. Activities within 98,000 acres (maps 73 and 74) would be limited during periods of critical winter use (when animals are actually present, generally December 15 to April 30 annually). During this period, no surface-disturbing activity may take place which would remove forage and browse plants used by the mule deer or elk, require a continued human presence (over 12 hours duration) within the area, involve sudden loud noises (such as detonation of surface charges), or sustained noise (such as chain saw or diesel generator). Hunting during a recognized hunting season in an official hunting area, as established by UDWR, would not be affected. Mule deer and elk winter range would be managed to protect it for deer and elk use. Under alternative C, mule deer and elk winter range would be

- open to mineral leasing with special conditions;
- open to disposal of mineral materials with special conditions;
- open to mineral entry with special seasonal conditions where plans of operations are required;
- avoided for right-of-way grants;
- open to private or commercial use of woodland products with special conditions;
- open to land treatments and range improvements with special conditions;
- open to development of watershed control structures with special conditions;
- closed to ORV use during the seasonal restriction period.

Riparian and Aquatic Habitat. A total of 14,980 acres (maps 75 and 76) would be inventoried, evaluated, and managed. Specific actions would be determined through activity plans after completion of the RMP. Special conditions may include limitations on grazing to protect riparian areas or allow increased vegetation cover, stabilization of soils where erosion and leaching of natural salts have decreased riparian habitat quality, limitations on surface-disturbing activities to prevent deterioration of riparian condition, rehabilitation of abandoned roads and mine tailings, restrictions on placement of erodible material, and cooperation with surface users to reduce surface disturbance. Under alternative C, riparian and aquatic habitat areas would be

- open to mineral leasing with special stipualtions to prevent surface occupancy within actual riparian and aquatic habitat areas;
- closed to disposal of mineral materials;
- open to mineral entry, subject to special conditions where plans of operations are required;
- avoided for right-of-way grants;
- excluded from private or commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- excluded from construction of livestock-related range improvements;
- designated as limited for ORV use, with use limited to designated roads and trails;
- subject to fire suppression methods which exclude motorized earth-moving equipment and aerial chemical fire retardants;

Offsite Mitigation, Big Game Habitat. On the 805,000 acres identified above (maps 71, 72, 73, and 74), when unreclaimed disturbance caused by a user totals more than 10 acres in 2 years, offsite mitigation would be required in addition to standard reclamation requirements. The offsite mitigation must be within the known habitat area and could include such measures as seedings or planting vegetation species favorable to the big game animals displaced or constructing water projects that would allow the animals to use other parts of the habitat area. Offsite mitigation projects must be approved in advance by the authorized officer.

Alternative D

Desert Bighorn Sheep Crucial Habitat. Activities within 175,000 acres (map 71, SRRA only) would be limited during the lambing and rutting seasons (April 15 to June 1 and October 16 to January 31 annually). During these periods, no activities may take place which require a continued human presence (over 12 hours duration) within the area or involve sudden loud noises (such as detonation of surface charges) or sustained noise (such as chain saw or diesel generator). Desert bighorn sheep crucial habitat would be managed with special conditions to protect it from deterioration and the animals from interference with lambing and rutting. Under alternative D, desert bighorn sheep crucial habitat would be

- open to mineral leasing with special conditions;
- open to disposal of mineral materials with special conditions;
- open to mineral entry with special conditions where plans of operations are required;
- avoided for right-of-way grants;
- open to private or commercial use of woodland products with special conditions;
- open to land treatments and range improvements with special conditions;
- closed to ORV use during the seasonal restriction periods.

Antelope Habitat. Use within 507,000 acres (map 72, SRRA only) would be limited during the lambing and rutting seasons (April 15 to June 1 and October 16 to January 31 annually). During these periods, no activities may take place which require a continued human presence (over 12 hours duration) within the area or involve sudden loud noises (such as detonation of surface charges) or sustained noise (such as chain saw or diesel generator). Antelope habitat would be managed with special conditions to protect the habitat for antelope use. Under alternative D, antelope habitat would be

- open to mineral leasing with special conditions;
- open to disposal of mineral materials with special conditions;
- open to mineral entry with special conditions where plans of operations are required;
- avoided for right-of-way grants;
- open to private or commercial use of woodland products with special conditions;
- open to land treatments and range improvements with special conditions;
- closed to ORV use during the seasonal restriction periods.

Mule Deer and Elk Crucial Winter Range. Activities within 103,900 acres (maps 73 and 74) would be limited during periods of critical winter use (when animals are actually present, generally December 15 to April 30 annually). During this period, no surface-disturbing activities may take place which would remove forage and browse plants used by the mule deer or elk, require a continued human presence (over 12 hours duration) within the area, involve sudden loud noises (such as detonation of surface charges), or sustained noise (such as chain saw or diesel generator). Hunting during a recognized hunting season in an official hunting area, as established by UDWR, would not be affected. Mule deer and elk winter range would be managed with special conditions to protect winter range values for deer and elk use. Under alternative D, mule deer and elk crucial winter range would be

- open to mineral leasing with special conditions;
- open to disposal of mineral materials with special conditions;
- open to mineral entry with special conditions where plans of operations are required;
- avoided for right-of-way grants;
- open to private or commercial use of woodland products with special conditions;
- open to land treatments and range improvements with special conditions;
- closed for ORV use during the seasonal restriction period.

Riparian and Aquatic Habitat. A total of 15,030 acres (maps 75 and 76) would be inventoried, evaluated, and protected. Specific actions would be determined through activity plans after completion of the RMP. Special conditions may include: limitations on grazing to protect riparian areas or allow increased vegetation cover; stabilization of soils where erosion and leaching of natural salts have decreased riparian habitat quality; limitations on surface-disturbing activities to prevent deterioration of riparian condition; rehabilitation of abondaned roads and mine tailings; restrictions on placement of erodible material; and cooperation with surface users to reduce surface disturbance. Under alternative D, riparian and aquatic habitat areas would be

- closed to mineral leasing within actual riparian and aquatic habitat areas;

- closed to disposal of mineral materials;
- withdrawn from mineral entry;
- excluded from right-of-way grants;
- excluded from private or commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- excluded from grazing use;
- available for land treatments and range improvements only where critical watershed values would be maintained or improved;
- designated as closed to ORV use;
- subject to fire suppression methods which exclude motorized earth-moving equipment and aerial chemical fire retardants.

Alternative E

Desert Bighorn Sheep Crucial Habitat. Activities within 140,000 acres (map 71, SRRA only) would be limited during the lambing and rutting seasons (April 15 to June 1 and October 16 to January 31 annually). During these periods, no activities may take place which require a continued human presence (over 12 hours duration) within the area or involve sudden loud noises (such as detonation of surface charges) or sustained noise (such as chain saw or diesel generator). Desert bighorn sheep crucial habitat would be managed with special conditions to protect the habitat from deterioration and the animals from interference with lambing and rutting. Under alternative E, desert bighorn sheep crucial habitat would be

- open to mineral leasing with special conditions;
- open to disposal of mineral materials with special conditions;
- open to mineral entry with special conditions where plans of operations are required;
- avoided for right-of-way grants;
- open to private or commercial use of woodland products with special conditions;
- open to land treatments and range improvements with special conditions.

Antelope Habitat. Activities within 506,680 acres (map 72) would be limited during the critical fawning period (between May 15 and July 15 annually). Fawning areas fall within the total habitat acreage given, but have not been mapped separately. During the fawning period, no activities may take place which require a continued human presence (over 12 hours duration) within the area or involve sudden loud noises (such as detonation of surface charges) or sustained noise (such as chain saw or diesel generator). Antelope habitat would be managed with special conditions to protect it for antelope use. Under alternative E, antelope habitat would be

- open to mineral leasing with special conditions;
- open to disposal of mineral materials with special conditions;
- open to mineral entry with special conditions where plans of operations are required;
- avoided for right-of-way grants;
- open to private or commercial use of woodland products with special conditions;
- open to land treatments and range improvements with special conditions.

Alternative F

Desert Bighorn Sheep Crucial Habitat. Activities within 174,590 acres (map 71, SRRA only) would be limited during the lambing and rutting seasons (April 15 to June 1 and October 16 to January 31 annually). During these periods, no activities may take place which require a continued human presence (over 12 hours duration) within the area or involve sudden loud noises (such as detonation of surface charges) or sustained noise (such as chain saw or diesel generator). Desert bighorn sheep critical habitat would be managed with special conditions to protect the habitat from deterioration and the animals from interference with lambing and rutting. Under alternative F, desert bighorn sheep crucial habitat would be

- open to mineral leasing with special conditions;
- open to disposal of mineral materials with special conditions;
- open to mineral entry with special conditions where plans of operations are required;
- avoided for right-of-way grants;
- open to private or commercial use of woodland products with special conditions;
- open to land treatments and range improvements with special conditions;
- designated as limited for ORV use, with use limited to designated roads and trails during seasonal restriction period.

Antelope Habitat. Activities within 506,660 acres (map 72) would be limited during the critical fawning period (between May 15 and July 15 annually). Fawning areas fall within the total habitat acreage given, but have not been mapped separately. During the fawning period, no activities may take place which require a continued human presence (over 12 hours duration) within the area or involve sudden loud noises (such as detonation of surface charges) or sustained noise (such as chain saw or diesel generator). Antelope habitat would be managed with special conditions to protect it for antelope use. This special condition would be applied following completion of the antelope fawning range inventory and would not apply to areas of antelope habitat not being used as fawning range. Under alternative F, antelope habitat would be

- open to mineral leasing with special conditions;
- open to disposal of mineral materials with special conditions;
- open to mineral entry with special conditions where plans of operations are required;
- avoided for right-of-way grants;
- open to private or commercial use of woodland products with special conditions;
- open to land treatments and range improvements with special conditions;
- designated as limited for ORV use, with use limited to designated roads and trails during seasonal restriction period.

Mule Deer and Elk Crucial Winter Range. Activities within 55,720 acres (maps 73 and 74) would be limited during periods of critical winter use (when animals are actually present, generally December 15 to April 30 annually). During this period, no surface-disturbing activity may take place which would remove forage and browse plants used by the mule deer or elk, require a continued human presence (over 12 hours duration) within the area, involve sudden loud noises (such as detonation of surface charges), or sustained noise (such as chain saw or diesel generator). Hunting during a recognized hunting season in an official hunting area, as established by UDWR, would not be affected. Mule deer and elk winter range would be managed with special conditions to protect winter range values for deer and elk use. Under alternative F, mule deer and elk crucial winter range would be

- open to mineral leasing with special conditions;
- open to disposal of mineral materials with special conditions;
- open to mineral entry with special conditions where plans of operations are required;
- avoided for right-of-way grants;
- open to private or commercial use of woodland products with special conditions;
- open to land treatments and range improvements with special conditions;
- designated as limited for ORV use, with use limited to designated roads and trails during seasonal restriction period.

Riparian and Aquatic Habitat (14,930 acres). A total of 14,930 acres (maps 75 and 76) would be inventoried, evaluated, and managed. Specific actions would be determined through activity plans after completion of the RMP. Special conditions may include limitations on grazing to protect riparian areas or allow increased vegetation cover, stabilization of soils where erosion and leaching of natural salts have decreased riparian habitat quality, limitations on surface-disturbing activities to prevent deterioration of riparian condition, rehabilitation of abandoned roads and mine tailings, restricitions on placement of erodible material, and cooperation with surface users to reduce surface disturbance. Under alternative F, riparian and aquatic habitat areas would be

- open to mineral leasing with special stipulations to prevent surface occupancy within actual riparian and aquatic habitat areas;
- closed to disposal of mineral materials;
- open to mineral entry, subject to special conditions where plans of operations are required;
- avoided for right-of-way grants;
- excluded from private or commercial use of woodland products, except for limited onsite collection of downed dead wood for campfires;
- open to land treatments and range improvements, where they would maintain or improve riparian and aquatic habitat;
- designated as limited to ORV use, with use limited to designated roads and trails;
- subject to fire suppression methods which exclude motorized earth-moving equipment and aerial chemical fire retardants.

Offsite Mitigation, Big Game Habitat. On the 736,970 acres identified above (maps 71, 72, 73, and 74), when unreclaimed disturbance caused by a user totals more than 10 acres in 2 years, offsite mitigation would be required in addition to standard reclamation requirements. The offsite mitigation must be within the known habitat area, but not necessarily within the crucial habitat area. Offsite mitigation could include such measures as seedings or planting vegetation species favorable to the big game animals displaced or constructing water projects that would allow the animals to use other parts of the habitat area. Offsite mitigation projects must be approved in advance by the authorized officer.

The following display summarizes wildlife habitat management actions that would occur under the six alternatives.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Support big game populations in suitable habitat areas.	Support big game populations in suitable habitat areas where livestock and mineral uses are not limited.	Support big game populations in suitable habitat areas so as to attain prior stable numbers.	Support big game populations in suitable habitat areas where watershed and cultural resource management are not limited.	Support big game populations in suitable habitat areas where motorized recreation opportunities are not limited.	Support big game populations in suitable areas only so long as critical soils are protected, and livestock use in noncrucial big game habitat areas is considered.
Develop and Implement new HMPs	**Develop and Implement new HMPs**	**Develop and Implement new HMPs**	**Develop and Implement new HMPs**	**Develop and Implement new HMPs**	**Develop and Implement new HMPs**
SRRA (0) 0	SRRA (0) 0	SRRA (7) 595,000	SRRA (7) 595,000	SRRA (7) 595,000	SRRA (7) 595,000
FPU (0) 0	FPU (0) 0	FPU (0) 0	FPU (0) 0	FPU (0) 0	FPU (0) 0
Total (0) 0	Total (0) 0	Total (7) 595,000	Total (7) 595,000	Total (7) 595,000	Total (7) 595,000

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
	Maximize wildlife species numbers and diversity to the extent possible, while resolving conflicts on a case-by-case basis.	Support the maximum number and diversity of wildlife species without limiting livestock and mineral uses.	Manage wildlife habitat to support a maximum of wildlife numbers and diversity.	Support the maximum number and diversity of wildlife species possible without limiting cultural resource management.	Support the maximum number and diversity of wildlife species possible without limiting motorized recreation opportunities.	Manage wildlife habitats to protect certain riparian areas and crucial big game habitats.
Crucial habitat for bighorn sheep	acres	acres	acres	acres	acres	acres
SRRA	150,000	120,000	200,000	175,000	140,000	174,590
FPU	0	0	0	0	0	0
Total	150,000	120,000	120,000	175,000	140,000	174,590
Habitat for antelope	acres	acres	acres	acres	acres	acres
SRRA	507,000	506,320	507,000	507,000	506,680	506,660
FPU	0	0	0	0	0	0
Total	507,000	506,320	507,000	507,000	506,680	506,660
Crucial habitat for mule deer	acres	acres	acres	acres	acres	acres
SRRA	16,450	15,610	32,200	34,730	16,100	16,910
FPU	19,060	18,100	37,800	40,770	18,900	19,850
Total	35,510	33,710	70,000	75,500	35,000	36,760
Crucial habitat for elk	acres	acres	acres	acres	acres	acres
SRRA	6,000	5,840	9,250	9,382	5,851	6,260
FPU	12,200	11,860	18,780	19,048	11,879	12,700
Total	18,200	17,700	28,030	28,430	17,730	18,960

4352 ENDANGERED SPECIES MANAGEMENT

Management Common to All Alternatives

No management action will be permitted on public lands that would jeopardize the continued existence of plant or animal species that are listed, are officially proposed for listing, or are candidates for listing as T/E.

The following T/E or candidate species and their habitats will be protected under all alternatives: Maguire daisy, Wright fishhook cactus, San Rafael cactus, Jones cycladenia, last chance townsendia, silver milkvetch, Smith wild buckwheat, yellow blanket flower, western sweetvetch, hymenoxys, Jones indigo bush, Barneby schoenocrambe, globemallow, bald eagle, peregrine falcon, black-footed ferret, humpback chub, bonytail chub, Colorado squawfish, ferruginous hawk, Swainson's hawk, western snowy plover, mountain plover, long-billed curlew, white-faced ibis, southern spotted owl, spotted bat, southwestern river otter, and razorback sucker.

BLM will cooperate with U.S. Fish and Wildlife Service (USFWS) in writing recovery plans for T/E species located within the planning area or grazing area. Also, BLM will consult USFWS for a formal or informal consultation under Section 7 of the Endangered Species Act before approving or implementing any action that may affect a protected species.

Candidate species listed by the State of Utah will be managed in similar fashion, except that no Section 7 consultation is required. BLM will continue to cooperate in surveys to determine the extent or existence of T/E or candidate species.

As required by the Endangered Species Act, recovery actions may be taken where possible in coordination with USFWS; such actions would require an activity plan. Transplants would be done in compliance with the Endangered Species Act; transplants would require a cooperative agreement and an activity plan.

Under all six alternatives, BLM would protect and conserve all officially listed and candidate species and their habitats.

4360 FIRE MANAGEMENT

Management Common to All Alternatives

Wildfires will be suppressed promptly where necessary to protect life, property, and high-risk resource values. In other areas, the cost of fire suppression will be compared to the resource loss that would occur without suppression. Prescribed fire will be used to implement or maintain resource values where necessary.

Fires will be suppressed in accordance with fire management activity plans prepared to implement RMP decisions. This plan will detail levels of suppression action, values at risk to be protected, and constraints on equipment and suppression techniques. Fire management plans will be developed and implemented in SRRA (1,463,840 acres) and FPU (43,550 acres), covering a total of 1,507,390 acres under all six alternatives.

Full-suppression areas designated under all six alternatives (map 77) would total 195,890 acres in SRRA and 25,640 acres in FPU, for a total of 211,530 acres in the planning area.

Conditional suppression would be applied to 1,267,950 acres in SRRA and 19,710 acres in FPU, for a total of 1,317,660 acres in the planning area. Prescribed-burn areas are not identified under any of the six alternatives.

4630 FIRE REHABILITATION

Management Common to All Alternatives

Under all six alternatives, all burned areas would be evaluated and, if appropriate, site-specific rehabilitation plans would be developed and implemented.

COMPARISON OF ALTERNATIVES AND IMPACTS

The six alternatives were analyzed to assess their impacts (effects) on the human environment in the planning area or grazing area. The elements of the environment found to be affected, either beneficially or adversely, are described in chapter 3. Analysis assumptions and the environmental effects are described in chapter 4.

In general, alternative B shows the greatest economic return of use or production of public grazing and mineral resources; alternative C shows the greatest protection of nonmotorized recreation opportunities and wildlife resources; alternative D shows the greatest protection of watershed areas and cultural resources; alternative E shows the greatest opportunities for motorized recreation (ORV use) and provides maximum opportunity for access development; and alternative F provides a balance between economic return and environmental protection.

Table 11 provides a summary comparison of the effects of the different alternatives on the environment. Alternative A provides an environmental baseline for comparing the impacts of the alternatives. For each element of the environment in the planning areas (or grazing area for grazing analysis) found to be affected, the specific indicator that would change is listed, along with the unit of change (usually acres). The change in the current conditions anticipated to occur by the year 2000 (12-year span) under present management is given for alternative A. For each of the other alternatives, the anticipated total amount is given for each indicator, along with the change from alternative A.

TABLE 11

Summary Comparison of Impacts, by Alternative
(By the Year 2000)

Environmental Component/ Specific Indicator		Unit	Alternative A Total Quantity	Alternative B Total Quantity (Change)	Alternative C Total Quantity (Change)	Alternative D Total Quantity (Change)	Alternative E Total Quantity (Change)	Alternative F Total Quantity (Change)
MINERAL COMPONENTS								
Oil and Gas								
Lease area								
	Category 1	SRRA acres (change)	1,130,280	1,416,050 (+285,770)	181,450 (-948,830)	168,510 (-961,770)	442,730 (-687,550)	710,920 (-419,360)
		FPU acres (change)	51,770	75,350 (+23,580)	12,260 (-39,510)	3,820 (-47,950)	29,080 (-22,690)	50,850 (-920)
		Total acres (change)	1,182,050	1,491,400 (+309,350)	193,710 (-988,340)	172,330 (-1,009,720)	471,810 (-710,240)	761,770 (-420,280)
	Category 2	SRRA acres (change)	43,130	45,730 (+2,600)	784,020 (+740,890)	77,990 (+34,860)	864,990 (+821,860)	505,430 (+462,300)
		FPU acres (change)	18,270	0 (-18,270)	58,270 (+40,000)	7,600 (-10,670)	43,570 (+25,300)	21,210 (+2,940)
		Total acres (change)	61,400	45,730 (-15,670)	842,290 (+780,890)	85,590 (+24,190)	908,560 (+847,160)	526,640 (+465,240)

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Category 3	SRRA acres	169,320	0	28,250	0	154,210	242,520
	(change)		(-169,320)	(-141,070)	(-169,320)	(-15,110)	(+73,200)
	FPU acres	5,310	0	2,120	0	2,700	3,290
	(change)		(-5,310)	(-3,190)	(-5,310)	(-2,610)	(-2,020)
	Total acres	174,630	0	30,370	0	156,910	245,810
	(change)		(-174,630)	(-144,260)	(-174,630)	(-17,720)	(+71,180)
Category 4	SRRA acres	121,110	2,060	470,120	1,217,340	1,910	4,970
	(change)		(-119,050)	(+349,010)	(+1,096,230)	(-119,200)	(-116,140)
	FPU acres	0	0	2,700	63,930	0	0
	(change)		(no change)	(+2,700)	(+63,930)	(no change)	(no change)
	Total acres	121,110	2,060	472,820	1,281,270	1,910	4,970
	(change)		(-119,050)	(+351,710)	(+1,160,160)	(-119,200)	(-116,140)
Oil Production	Barrels/year	13,200	13,200	13,200	3,000	13,200	13,200
	(change)		(no change)	(no change)	(-10,200)	(no change)	(no change)
Gas Production	MCF/year	754,000	754,000	754,000	244,000	754,000	754,000
	(change)		(no change)	(no change)	(-510,000)	(no change)	(no change)
Geophysical operations (seismic line)							
	Miles/year	100	125	100	25	100	100
	(change)		(+25)	(no change)	(-75)	(no change)	(no change)

(Continued)

TABLE 11 (Continued)

Environmental Component/ Specific Indicator	Unit	Alternative A Total Quantity	Alternative B Total Quantity (Change)	Alternative C Total Quantity (Change)	Alternative D Total Quantity (Change)	Alternative E Total Quantity (Change)	Alternative F Total Quantity (Change)
Coal							
Exploration area	SRRA acres	32,440	33,720	32,440	15,930	33,720	32,430
	(change)		(+1,280)	(no change)	(-16,510)	(+380)	(-10)
	FPU acres	25,870	28,570	25,870	2,540	28,570	25,870
	(change)		(+2,700)	(no change)	(-23,330)	(2,700)	(no change)
	Total acres	58,310	62,290	58,310	18,470	62,290	58,300
	(change)		(+3,980)	(no change)	(-39,840)	(+3,980)	(-10)
Lease area	SRRA acres	29,620	29,620	28,340	11,830	29,620	29,610
	(change)		(no change)	(-1,280)	(-17,790)	(no change)	(-10)
	FPU acres	28,570	28,570	25,870	2,540	28,570	28,570
	(change)		(no change)	(-2,700)	(-26,030)	(no change)	(no change)
	Total acres	58,190	58,190	54,210	14,370	58,190	58,180
	(change)		(no change)	(-3,980)	(-43,820)	(no change)	(-10)
Production	SRRA tons/year	150,000	150,000	150,000	150,000	150,000	150,000
	(change)		(no change)	(no change)	(no change)	(no change)	(no change)
	FPU tons/year	0	0	0	0	0	0
	(change)		(no change)	(no change)	(no change)	(no change)	(no change)
	Total tons/year	150,000	150,000	150,000	150,000	150,000	150,000
	(change)		(no change)	(no change)	(no change)	(no change)	(no change)
Mineral Materials							
Disposal area	SRRA acres	1,463,840	1,461,780	961,620	246,500	1,307,720	1,216,350
	(change)		(-2,060)	(-502,220)	(-1,217,340)	(-156,120)	(-247,490)

	FPU acres (change)	75,380	75,380 (no change)	70,530 (-4,820)	11,420 (-63,930)	72,650 (-2,700)	72,060 (-3,290)
	Total acres (change)	1,539,190	1,537,130 (-2,060)	1,032,150 (-507,040)	257,920 (-1,281,270)	1,380,370 (-158,820)	1,288,410 (-250,780)
Production	Total cu yds/year (change)	320,000	320,000 (no change)	320,000 (no change)	50,000 (-270,000)	320,000 (no change)	320,000 (no change)
Locatable Minerals							
Open to mineral entry	SRRA acres (change)	1,462,060	1,460,000 (-2,060)	991,940 (-470,120)	245,700 (-1,216,360)	1,460,150 (-1,910)	1,457,090 (-4,970)
	FPU acres (change)	75,350	75,350 (no change)	72,650 (-2,700)	11,420 (-63,930)	75,350 (no change)	75,350 (no change)
	Total acres (change)	1,537,410	1,535,350 (-2,060)	1,064,590 (-472,820)	257,120 (-1,280,290)	1,535,500 (-1,910)	1,532,440 (-4,970)
BIOTIC COMPONENTS							
Soils							
Soils loss	Planning area tons/year (change)	7,263,740 to 61,384,300	7,009,990 to 59,447,050 (-253,750 to -1,907,250)	5,820,630 to 49,580,850 (-1,443,110 to -11,803,450)	5,672,220 to 48,383,140 (-1,591,530 to -13,001,170)	6,053,250 to 51,394,370 (-1,210,490 -9,989,930)	6,483,510 55,198,570 (-780,230 -6,185,730)
	Average tons/year (change)	34,324,020	33,243,520 (-1,080,500)	27,700,740 (-6,623,280)	27,027,680 (-7,296,350)	28,723,810 (-5,600,210)	30,041,040 (-3,482,980)

(Continued)

TABLE 11 (Continued)

Environmental Component/ Specific Indicator	Unit	Alternative A Total Quantity	Alternative B Total Quantity (Change)	Alternative C Total Quantity (Change)	Alternative D Total Quantity (Change)	Alternative E Total Quantity (Change)	Alternative F Total Quantity (Change)
Water							
Surface water quality							
Sediment Yield	Planning area tons/year (change)	2,905,500 to 24,553,710	2,804,000 to 23,790,820 (-101,500 to -762,890)	2,328,260 to 19,832,330 (-577,240 to -4,721,380)	2,268,890 to 19,353,240 (-636,610 to -5,200,470)	2,421,310 to 20,557,740 (-484,190 to -3,995,970)	2,593,410 to 22,079,420 (-312,090 to -2,474,290)
Average	Planning area tons/year (change)	13,729,605	13,297,410 (-432,195)	11,080,295 (-2,649,310)	10,811,065 (-2,918,540)	11,489,525 (-2,240,080)	12,336,415 (-1,393,190)
Salt Yield	Planning area tons/year (change)	29,470 to 430,917	27,735 to 418,154 (-1,735 to -12,763)	23,003 to 348,578 (-6,467 to -82,339)	22,034 to 340,636 (-7,436 to -90,281)	24,352 to 360,785 (-5,118 to -70,132)	25,731 to 387,776 (-3,739 to -43,141)
Average	Planning area tons/year (change)	230,194	222,945 (-7,249)	185,791 (-44,403)	181,335 (-48,859)	192,569 (-37,625)	206,254 (-23,440)
Vegetation							
Disturbance (short-term loss)	acres (change)	47,474	17,134 (-30,340)	18,479 (-28,995)	6,746 (-40,728)	40,104 (-7,370)	31,844 (-15,630)
(long-term)	acres (change)	7,070	250 (-6,820)	7,220 (+150)	1,670 (-5,400)	8,060 (+990)	7,980 (+910)
Total disturbed	acres (change)	54,544	17,384 (-37,160)	25,699 (-28,845)	8,416 (-46,128)	48,164 (-6,380)	39,824 (-14,720)

Wild Horses and Burros

Habitat area	SRRA acres	475,680	475,680	475,680	475,680	[a]475,680	475,680
	(change)		(no change)	(no change)	(no change)	(no change)	(no change)
Forage	SRRA AUMs	2,835	495	1,345	1,540	3,935	2,135
	(change)		(-2,340)	(-1,490)	(-1,295)	(+1,100)	(-700)
Wild horses	SRRA animals	200 to 235	20 to 35	70 to 100	90 to 115	250 to 325	75 to 125
	(change)		(-180 to -200)	(-130 to -135)	(-100 to -120)	(+50 to +90)	(-125 to -110)
Wild burros	SRRA animals	70 to 100	10 to 25	25 to 60	50 to 70	110 to 140	30 to 70
	(change)		(-60 to -15)	(-45 to -40)	(-20 to -30)	(+40 to +40)	(-40 to -30)

[a] No HMAP would be developed under alternative E.

Wildlife

Crucial habitat: Desert bighorn sheep	Acres	150,000	120,000	200,000	175,000	140,000	174,590
	(change)		(-30,000)	(+50,000)	(+25,000)	(-10,000)	(+24,590)
Desert bighorn sheep	Animals	500	350	860	750	550	800
	(change)		(-150)	(+360)	(+250)	(+50)	(+300)
Habitat: Antelope	Acres	507,000	506,320	507,000	507,000	506,680	506,660
	(change)		(-680)	(0)	(0)	(-320)	(-340)
Antelope	Animals	700	400	1,060	1,000	950	900
	(change)		(-300)	(+360)	(+300)	(+250)	(+200)

(Continued)

TABLE 11 (Continued)

Environmental Component/ Specific Indicator	Unit	Alternative A Total Quantity	Alternative B Total Quantity (Change)	Alternative C Total Quantity (Change)	Alternative D Total Quantity (Change)	Alternative E Total Quantity (Change)	Alternative F Total Quantity (Change)
Crucial habitat: Mule deer	SRRA acres (change)	16,450	15,610 (-840)	32,200 (+15,750)	34,730 (+18,280)	16,100 (-350)	16,910 (+460)
	FPU acres (change)	19,060	18,100 (+950)	37,800 (+18,750)	40,770 (+21,720)	18,900 (-160)	19,850 (+800)
	Total acres (change)	35,510	33,710 (-1,790)	70,000 (+34,490)	75,500 (+39,990)	35,000 (-510)	36,760 (+1,260)
Mule deer	SRRA animals (change)	5,890	4,335 (-1,555)	7,930 (+2,040)	7,930 (+2,040)	5,740 (-150)	7,400 (+1,510)
	FPU animals (change)	730	535 (-195)	1,270 (+540)	1,270 (+540)	710 (-20)	920 (+190)
	Total animals (change)	6,620	4,870 (-1,750)	9,200 (+2,580)	9,200 (+2,580)	6,450 (-170)	8,320 (+1,700)
Crucial habitat: Elk	SRRA (change)	6,000	5,840 (-160)	9,240 (+3,240)	9,370 (+3,370)	5,840 (-160)	6,260 (+260)
	FPU (change)	12,200	11,860 (-340)	18,760 (+6,560)	19,030 (+6,830)	11,860 (-340)	12,700 (+500)
	Total amount (change)	18,200	17,700 (-500)	28,000 (+9,800)	28,400 (+10,200)	17,700 (-500)	18,960 (+760)
Elk	SRRA (change)	110	70 (-40)	140 (+30)	140 (+30)	105 (-5)	130 (+20)
	FPU (change)	490	340 (-150)	610 (+120)	610 (+120)	485 (-5)	600 (+110)
	Total amount (change)	600	410 (-190)	750 (+150)	750 (+150)	590 (-10)	730 (+130)

Habitat:							
Riparian and aquatic	SRRA acres	11,430	11,430	11,580	11,620	11,430	11,540
	(change)		(no change)	(+150)	(+190)	(no change)	(+110)
	FPU acres	3,350	3,350	3,400	3,410	3,350	3,390
	(change)		(no change)	(+50)	(+60)	(no change)	(+40)
	Total acres	14,780	14,780	14,980	15,030	14,780	14,930
	(change)		(no change)	(+200)	(+250)	(no change)	(+150)

HUMAN USES

Grazing

Grazing area	SRRA acres	1,421,880	1,430,580	1,345,240	1,403,390	1,418,810	1,416,080
	(change)		(+8,700)	(-76,640)	(-18,490)	(-3,070)	(-5,800)
	FPU acres	190,240	190,240	190,240	190,240	190,240	190,240
	(change)		(no change)	(no change)	(no change)	(no change)	(no change)
	Total acres	1,612,120	1,620,820	1,535,480	1,592,630	1,609,050	1,606,320
	(change)		(+8,700)	(-76,640)	(-18,490)	(-3,070)	(-5,800)
5-year average licensed use	AUMs	56,161	96,006	45,380	28,682	55,102	55,751
	(change)		(+39,845)	(-10,781)	(-27,479)	(-1,059)	(-410)
Active preference	AUMs	87,542	96,006	72,758	44,258	86,528	86,198
	(change)		(+8,464)	(-14,784)	(-43,284)	(-1,014)	(-1,344)

(Continued)

TABLE 11 (Continued)

Environmental Component/ Specific Indicator	Unit	Alternative A Total Quantity	Alternative B Total Quantity (Change)	Alternative C Total Quantity (Change)	Alternative D Total Quantity (Change)	Alternative E Total Quantity (Change)	Alternative F Total Quantity (Change)
Forest Products							
Forest Product use area							
Standard Conditions	SRRA acres (change)	395,350	401,130 (+5,780)	6,550 (-388,800)	85,110 (-310,240)	197,570 (-197,780)	138,610 (-256,740)
	FPU acres (change)	35,540	36,320 (+780)	18,040 (-17,500)	15,580 (-19,960)	22,730 (-12,810)	30,580 (-4,960)
	Total acres (change)	430,890	437,450 (+6,560)	24,590 (-406,300)	100,690 (-330,200)	220,300 (-210,590)	169,190 (-261,700)
Special Conditions	SRRA acres (change)	4,770	0 (-4,770)	168,290 (+163,520)	198,930 (+194,160)	197,570 (+192,800)	201,320 (+196,550)
	FPU acres (change)	0	0 (no change)	12,530 (+12,530)	2,200 (+2,200)	0 (no change)	4,790 (+4,790)
	Total acres (change)	4,770	0 (-4,770)	180,820 (+176,050)	201,130 (+196,360)	197,570 (+192,800)	206,110 (+201,340)
Excluded From Campfire Use	SRRA acres (change)	490	510 (+20)	1,100 (+610)	6,800 (+6,310)	510 (+20)	570 (+80)
	FPU acres (change)	0	0 (no change)	0 (no change)	0 (no change)	0 (no change)	0 (no change)
	Total acres (change)	490	510 (+20)	1,100 (+610)	6,800 (+6,310)	510 (+20)	570 (+80)

Excluded From Harvest	SRMA acres	14,830	13,820	240,110	130,910	237,660	75,010
	(change)		(-1,010)	(+225,280)	(+116,080)	(+222,830)	(+60,180)
	FPU acres	780	0	5,740	18,540	13,590	950
	(change)		(-780)	(+4,960)	(+17,760)	(+12,810)	(+170)
	Total acres	15,610	13,820	245,850	149,450	251,250	75,960
	(change)		(-1,790)	(+230,240)	(+133,840)	(+235,640)	(+60,350)
Cultural Resources							
Sites damaged	Sites	6,735	6,712	6,060	1,507	6,738	6,707
	(change)		(-23)	(-675)	(-5,228)	(+3)	(-28)
Sites available for use	Sites	2,489	2,530	2,477	2,385	2,489	2,489
	(change)		(+41)	(-12)	(-104)	(no change)	(no change)
Recreation							
Area Meeting Recreation Opportunity Spectrum Criteria							
P	Total acres	69,680	18,650	114,220	114,240	31,380	81,500
	(change)		(-51,030)	(+44,540)	(+44,560)	(-38,300)	(+11,820)
SPNM	Total acres	183,410	194,650	231,140	232,950	186,910	211,700
	(change)		(+11,240)	(+47,730)	(+49,540)	(+3,500)	(+28,290)
SPM	Total acres	662,870	629,060	603,400	716,250	675,550	630,920
	(change)		(-33,810)	(-59,470)	(+53,380)	(+12,680)	(-31,950)
RN	Total acres	606,720	684,580	581,420	471,440	626,110	599,810
	(change)		(+77,860)	(-25,300)	(-135,280)	(+19,390)	(-6,910)

(Continued)

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TABLE 11 (Continued)

Environmental Component/ Specific Indicator	Unit	Alternative A Total Quantity	Alternative B Total Quantity (Change)	Alternative C Total Quantity (Change)	Alternative D Total Quantity (Change)	Alternative E Total Quantity (Change)	Alternative F Total Quantity (Change)
R	Total acres (change)	10,670	12,210 (+1,540)	10,500 (-170)	5,260 (-5,410)	11,410 (+740)	10,630 (-40)
U	Total acres (change)	20	40 (+20)	20 (no change)	30 (+10)	20 (no change)	20 (no change)
ORV recreation area							
Open	Total acres (change)	1,539,190	0 (-1,539,190)	194,640 (-1,344,550)	172,360 (-1,366,830)	1,380,870 (-158,320)	761,820 (-777,370)
Open with seasonal restrictions	Total acres (change)	0	0 (no change)	246,700 (+246,700)	84,770 (+84,770)	0 (no change)	61,060 (+61,060)
Limited to existing roads and trails	Total acres (change)	0	1,493,230 (+1,493,230)	0 (no change)	0 (no change)	156,910 (+156,910)	0 (no change)
Limited to designated roads and trails	Total acres (change)	0	43,940 (+43,940)	606,110 (+606,110)	840 (+840)	1,410 (+1,410)	711,840 (+711,840)
Closed	Total acres (change)	0	2,020 (+2,020)	491,740 (+491,740)	1,281,220 (+1,281,220)	0 (no change)	4,470 (+4,470)
Visual Resources							
VRM class area							
I	Total acres (change)	0	0 (no change)	472,130 (+472,130)	430,450 (+430,450)	135,730 (+135,730)	231,750 (+231,750)

II	Total acres	496,370	496,370	725,940	168,220	959,610	288,240
	(change)		(no change)	(+229,570)	(-325,150)	(+463,240)	(-208,130)
III	Total acres	383,270	383,270	166,850	345,540	199,590	364,040
	(change)		(no change)	(-216,420)	(-37,730)	(-183,680)	(-19,230)
IV	Total acres	659,550	659,550	174,270	594,980	244,260	655,160
	(change)		(no change)	(-485,280)	(-64,570)	(-415,290)	(-4,390)
Contrast rating scores exceeding VRM objectives	Total scores	120	150	106	67	136	118
	(change)		(+30)	(-14)	(-53)	(+16)	(-2)

Lands

Lands available for rights-of-way

Within corridors	SRRA acres	0	22,870	0	0	12,890	21,540
	(change)		(+22,870)	(no change)	(no change)	(+12,890)	(+21,540)
	FPU acres	0	4,470	0	0	4,170	2,900
	(change)		(+4,470)	(no change)	(no change)	(+4,170)	(+2,900)
	Total acres	0	27,340	0	0	17,060	24,440
	(change)		(+27,340)	(no change)	(no change)	(+17,060)	(+24,440)
Outside corridors (standard conditions)	SRRA acres	1,412,950	1,393,180	181,450	168,510	429,840	704,510
	(change)		(-19,770)	(-1,231,500)	(-1,244,440)	(-983,110)	(-708,440)
	FPU acres	72,650	70,880	12,260	3,820	24,910	48,250
	(change)		(-1,770)	(-60,390)	(-68,830)	(-47,740)	(-24,400)
	Total acres	1,485,600	1,464,060	193,710	172,330	454,750	752,760
	(change)		(-21,540)	(-1,291,890)	(-1,313,270)	(-1,030,850)	(-732,840)

(Continued)

TABLE 11 (Continued)

Environmental Component/ Specific Indicator	Unit	Alternative A Total Quantity	Alternative B Total Quantity (Change)	Alternative C Total Quantity (Change)	Alternative D Total Quantity (Change)	Alternative E Total Quantity (Change)	Alternative F Total Quantity (Change)
Avoidance areas	SRRA acres (change)	50,890	45,760 (-5,130)	812,070 (+761,380)	77,990 (+27,100)	1,019,200 (+968,310)	732,820 (+681,930)
	FPU acres (change)	2,700	0 (-2,700)	60,390 (+57,690)	7,600 (+4,900)	46,270 (+43,570)	24,200 (+21,500)
	Total acres (change)	53,590	45,760 (-7,830)	872,660 (+819,070)	85,590 (+32,000)	1,065,470 (+1,011,880)	757,020 (+703,430)
Exclusion areas	SRRA acres (change)	0	2,030 (+2,030)	470,120 (+470,120)	1,217,340 (+1,217,340)	1,910 (+1,910)	4,970 (+4,970)
	FPU acres (change)	0	0 (no change)	2,700 (+2,700)	63,930 (+63,930)	0 (no change)	0 (no change)
	Total acres (change)	0	2,030 (+2,030)	472,820 (+472,820)	1,281,270 (+1,281,270)	1,910 (+1,910)	4,970 (+4,970)
Lands available for disposal	SRRA acres (change)	5,780	0 (-5,780)	6,140 (+360)	710 (-5,070)	6,770 (+990)	6,730 (+950)
	FPU acres (change)	1,040	0 (-1,040)	830 (-210)	710 (-330)	1,040 (no change)	1,000 (-40)
	Total acres (change)	6,820	0 (-6,820)	6,970 (+150)	1,420 (-5,400)	7,810 (+990)	7,730 (+910)
Withdrawals from mineral entry	SRRA acres (change)	1,780	3,840 (+2,060)	471,900 (+470,120)	1,218,140 (+1,216,360)	3,690 (+1,910)	6,750 (+4,970)
	FPU acres (change)	0	0 (no change)	2,700 (+2,700)	63,930 (+63,930)	0 (no change)	0 (no change)
	Total acres (change)	1,780	3,840 (+2,060)	474,600 (+472,820)	1,282,070 (+1,280,290)	3,690 (+1,910)	6,750 (+4,970)

Lands identified for acquisition	SRRA acres	0	0	7,160	2,400	0	3,200
	(change)		(no change)	(+7,160)	(+2,400)	(no change)	(+3,200)
	FPU acres	0	0	1,420	0	0	0
	(change)		(no change)	(+1,420)	(no change)	(no change)	(no change)
	Total acres	0	0	8,580	2,400	0	3,200
	(change)		(no change)	(+8,580)	(+2,400)	(no change)	(+3,200)
ECONOMIC CONSIDERATIONS							
All Mining							
Employment	Jobs	360	368	359	83	359	unquantified
	(change)		(+8)	(-1)	(-277)	(-1)	(insignificant)
Earnings	Dollars	10,093,200	10,291,500	10,074,400	2,314,600	10,074,400	unquantified
	(change)		(+198,300)	(-18,800)	(-7,768,628)	(-18,800)	(insignificant)
Revenues	Dollars	146,800	152,600	145,000	36,700	145,000	unquantified
	(change)		(+5,800)	(-1,800)	(-110,100)	(-1,800)	(insignificant)
Soil and Water							
Sediment Cost	Dollars	218,000	206,500	171,500	170,200	177,800	190,650
		to 1,840,100	to 1,755,200	to 1,458,000	to 1,451,500	to 1,512,800	to 1,626,800
	(change)		(-11,500	(-46,500	(-47,800	(-40,200	(-27,300
			to -84,800)	to 381,800)	to -388,600)	to -327,300)	to -213,200)
Salinity Cost	Dollars	1,724,000	1,573,100	1,296,200	1,289,000	1,375,200	1,455,800
		to 25,208,600	to 24,081,000	to 20,010,800	to 19,927,200	to 20,724,900	to 22,303,900
	(change)		(-150,900	(-427,800	(-435,000	(-348,800	(-268,200
			to -1,127,600)	to -5,197,800)	to -5,281,400)	to -4,483,700)	to -2,904,800)

(Continued)

TABLE 11 (Concluded)

Environmental Component/ Specific Indicator	Unit	Alternative A Total Quantity	Alternative B Total Quantity (Change)	Alternative C Total Quantity (Change)	Alternative D Total Quantity (Change)	Alternative E Total Quantity (Change)	Alternative F Total Quantity (Change)
Livestock							
Returns Above Variable Cost	Dollars	912,200	1,759,000	355,700	113,900	637,500	690,300
	(change)		(+846,800)	(-556,500)	(-798,400)	(-274,700)	(-221,900)
Wealth	Dollars	26,392,700	26,851,400 to 28,420,500	25,889,200	25,125,300	26,375,300	26,407,700
	(change)		(+423,200 to +1,992,300)	(-539,100)	(-1,196,500)	(-3,000)	(-20,500)
Employment	Jobs	156	228	124	57	154	148
	(change)		(+72)	(-32)	(99)	(-2)	(-8)
Earnings	Dollars	459,500	671,600	365,900	66,700	453,900	435,400
	(change)		(+212,100)	(-93,600)	(-292,700)	(-5,600)	(-24,100)
Revenues	Dollars	319,400	466,900	254,400	115,900	315,600	302,700
	(change)		(+174,500)	(-65,000)	(-203,500)	(-3,900)	(-16,700)
Recreation							
Employment	Jobs	27	20	36	37	27	31
	(change)		(-7)	(+9)	(+10)	(no change)	(+4)
Earnings	Dollars	236,700	186,700	314,100	323,700	232,900	275,900
	(change)		(-50,000)	(+77,400)	(+87,000)	(-3,800)	(+39,200)
Revenues	Dollars	35,400	27,800	47,200	48,810	34,800	41,400
	(change)		(-7,600)	(+11,800)	(+13,400)	(no change)	(6,000)

Wildlife								
Employment	Jobs	20	14	28	30	19	24
	(change)		(-6)	(+8)	(10)	(-1)	(+4)
Earnings	Dollars	174,600	124,300	251,700	261,300	170,500	213,500
	(change)		(-50,030)	(+77,436)	(+86,996)	(-3,824)	(+39,196)
Revenues	Dollars	26,800	19,100	38,700	40,100	26,200	32,800
	(change)		(-7,685)	(+11,895)	(+13,364)	(-587)	(+6,021)
Other Land Uses							
Employment	Jobs	36	unquantified	unquantified	9	unquantified	unquantified
	(change)		(insignificant)	(insignificant)	(-27)	(insignificant)	(insignificant)
Earnings	Dollars	494,800	unquantified	unquantified	118,744	unquantified	unquantified
	(change)		(insignificant)	(insignificant)	(-376,022)	(insignificant)	(insignificant)
Revenues	Dollars	45,400	unquantified	unquantified	10,832	unquantified	unquantified
	(change)		(insignificant)	(insignificant)	(-34,302)	(insignificant)	(insignificant)
Payments in Lieu of Taxes	Dollars	8,600	1,800	8,800	3,200	9,600	9,600
	(change)		(-6,820)	(+150)	(-5,400)	(+990)	(+970)
Plan Budget							
Employment	Jobs	9	12	12	10	10	12
	(change)		(+3)	(+3)	(+1)	(+1)	(+3)
Earnings	Dollars	105,700	133,000	137,500	120,300	124,000	143,500
	(change)		(+32,337)	(+31,769)	(+14,561)	(+18,344)	(+37,823)
Revenues	Dollars	2,400	3,100	3,100	2,700	2,800	3,200
	(change)		(+722)	(+709)	(+325)	(+409)	(+844)

Chapter 3

CHAPTER 3, AFFECTED ENVIRONMENT

INTRODUCTION

The affected environment is that which would be significantly changed by implementing any of the alternatives described in chapter 2 of this draft resource management plan and environmental impact statement (RMP/EIS). The affected environment was determined through the analysis in chapter 4 and is described by environmental indicators (table 12), which were the basis for table 11 in chapter 2. The entire spectrum of the environment of the planning and grazing areas is described in the management situation analysis (MSA). Laws referenced are cited in appendix D.

For convenience, the environmental indicators are divided into groups: mineral components, biotic components, human uses, and economic considerations, and social conditions. Both the existing condition and the assumed changes over time (until the year 2000) are given for each indicator. These provide a basis for measuring changes and comparing the alternatives. Most of the general indicators are broken down into more narrow topics called specific indicators (table 12).

MINERAL COMPONENTS

OIL AND GAS

Location and Extent of Resource

Hydrocarbon resources are scattered throughout the entire planning area, but are minimal in Forest Planning Unit (FPU). The following discussion therefore concentrates on San Rafael Resource Area (SRRA).

Oil and gas are found in both stratigraphic and structural traps. The planning area has many widespread sedimentary formations that either produce oil and gas or have potential for production: Devonian sandstones and limestones, Mississippian carbonates, Pennsylvanian carbonates, Permian carbonates and sandstones, Triassic sandstones, and Cretaceous sandstones. Combining these formations with structural features creates several potential oil and gas traps (figure 2).

Tar sand deposits have not been identified in FPU, but are found in SRRA. The San Rafael Swell Special Tar Sand Area (STSA) covers about 126,960 acres of public land and contains an estimated 385 million barrels of oil [Campbell, 1977].

Allocations

Hydrocarbon resources are allocated in three stages, beginning with a determination of which lands should be leased and under what conditions. The RMP process is used to make these determinations. Public lands are placed into one of four leasing categories (appendix E): (1) open to leasing with standard lease stipulations; (2) open to leasing with special conditions; (3) open to leasing with no-surface-occupancy stipulations; and (4) closed to leasing. Current category acreages in the planning area are shown in table 13 and on map 17.

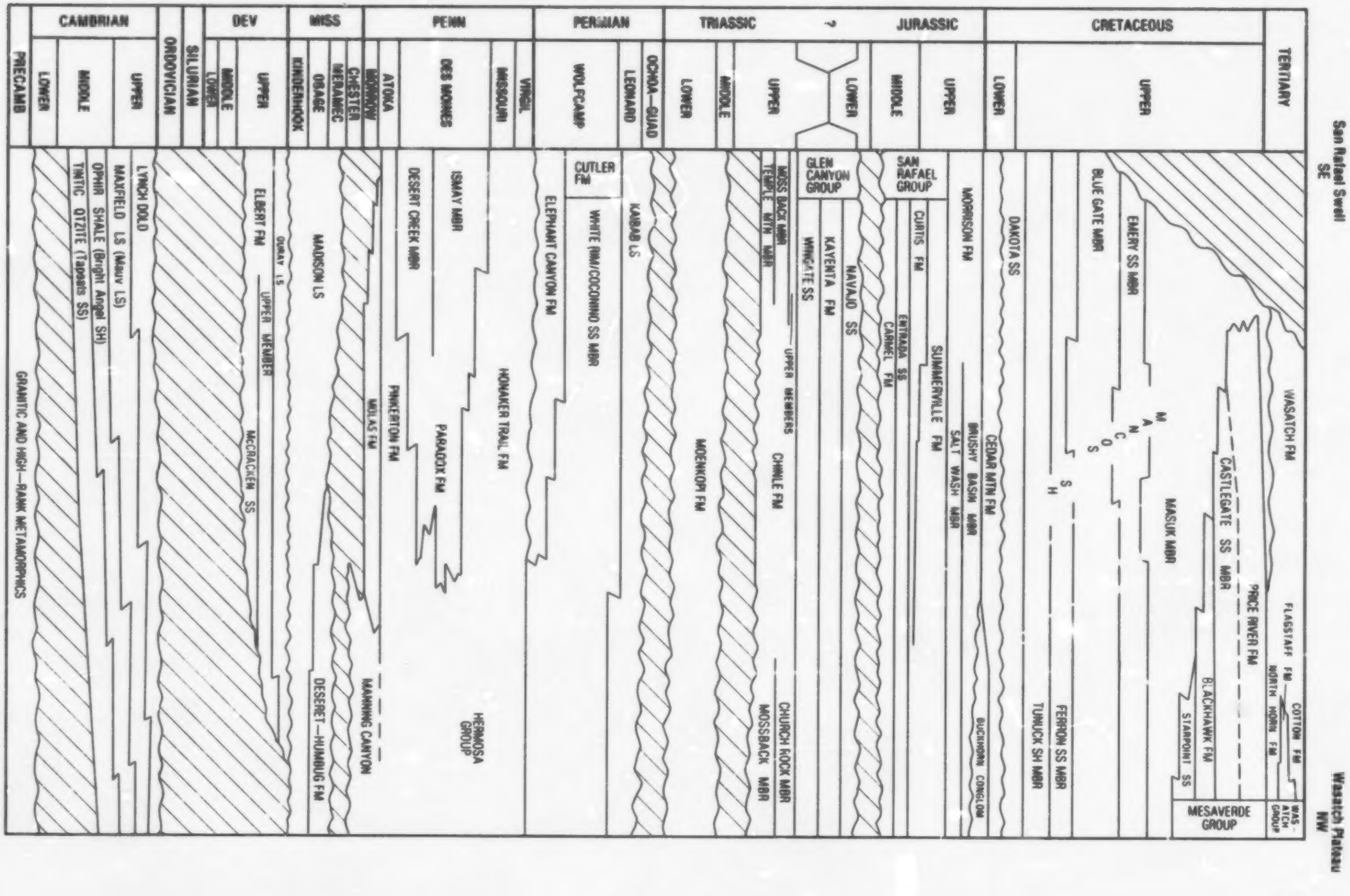

FIGURE 2

Correlation Chart, East-Central Utah

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TABLE 12

General and Specific Environmental Indicators

Category	General Indicator	Specific Indicators
MINERAL COMPONENTS	Oil and Gas	Area available for lease; oil and gas production; geophysical operations
	Coal	Area available for exploration; area available for lease; coal production
	Mineral Materials	Area available for material disposal; mineral material production
	Locatable Minerals	Area available for location
BIOTIC COMPONENTS	Soils	Soil loss
	Water	Salt and sediment yield; ground water quality; salt in Colorado River
	Air	Visibility
	Vegetation	Area of vegetation loss; relict areas; ecological status
	Threatened or Endangered (T/E) Plants	Loss of individual plants; loss of habitat area
	Wild horses and burros	Habitat area; available forage; population numbers
	Desert bighorn sheep	Crucial habitat; population numbers
	Antelope	Habitat; population numbers
	Mule deer	Crucial winter range; population numbers
	Elk	Crucial winter range; population numbers
	Riparian and aquatic habitat	Habitat area
	T/E animal species	Loss of individual animals; loss of habitat area
HUMAN USES	Grazing	Area available for livestock grazing; forage available for livestock
	Forest Product Use	Area available for forest product harvest and fuelwood; area available for gathering of dead fuelwood for campfires
	Cultural Resources	Cultural sites damaged; cultural sites available for use
	Recreation	Area in each recreation opportunity spectrum (ROS) class; area available for off-road vehicle (ORV)recreation;
	Visual Resources	Area in each visual resource management (VRM) class; visual contrast rating scores
	Lands	Lands available for rights-of-way; lands available for disposal; lands needed for acquisition; withdrawals
ECONOMIC CONSIDERATIONS	Minerals	Earnings; employment; costs; sales and revenues; profits; wealth; tax revenues
	Soil and Water	Earnings; employment; costs; sales and revenues; profits; wealth; tax revenues
	Livestock	Returns to labor and investment; earnings; employment; costs; sales and revenues; profits; wealth; tax revenues
	Recreation	Earnings; employment; costs; sales and revenues; profits; wealth; tax revenues
	Wildlife	Earnings; employment; costs; sales and revenues; profits; wealth; tax revenues
	Other Land Uses	Earnings; employment; costs; sales and revenues; profits; wealth; tax revenues
	Plan Budget	Earnings; employment; costs; sales and revenues; profits; wealth; tax revenues
	Land-Disturbing Activities	Earnings; employment; costs; sales and revenues; profits; wealth; tax revenues
SOCIAL CONDITIONS		Community lifestyles; individual lifestyles

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TABLE 13

Oil and Gas Leasing Category Acreages

Category	SRRA	FPU
1	1,130,280	51,770
2	43,130	18,270
3	169,320	5,310
4	121,110	0
TOTALS	1,463,840	75,350

Source: Oil and Gas Leasing Category Plats.

The second allocation stage is leasing, which is handled by the Bureau of Land Management's (BLM's) Utah State Office (USO) (see chapter 2). The third stage includes exploration, development, and production operations.

Geophysical activity is measured in miles of seismic line. Approximately 500 miles of seismic line were run in the planning area between 1982 and 1985, none in 1986 or 1987. FPU has had no measurable geophysical exploration in the past 5 years.

Resource Condition and Potential

Generally, areas of high potential surround areas of current (1987) production; medium-potential areas have had oil and gas shows in favorable rocks; and low potential areas are those where there have been no shows and where no traps are apparent.

Potential for occurrence of oil and gas resources is high over approximately 106,310 acres (7 percent of the planning area), medium on 936,540 acres (64 percent), and low on 420,990 acres (29 percent) (map 78). Potential for occurrence of oil and gas is moderate over the entire FPU (75,350 acres). Production occurred on less than 1 percent of the planning area.

High potential for oil and gas production is from three fields: the Flat Canyon and Ferron fields in the Wasatch Plateau area and the South Last Chance field in the southern San Rafael Swell area.

Oil and gas potential is low in San Rafael Reef, where the rocks are faulted and folded at 90 degrees and exposed at the surface, and in the Green River corridor, where exposure has caused the hydrocarbons to degrade or migrate out of the potential reservoir rock.

The San Rafael STSA is located in the central portion of the San Rafael Swell. Campbell [1977] estimates the STSA contains 385 million barrels of oil.

Development of tar sand resources in the planning area before the year 2000 is considered unlikely. Future development will depend entirely on demand; as the world supply begins to dwindle, more exploration for small deposits such as those found in the planning area is expected to occur.

Oil and gas exploration has been active in SRRA since the first two wells were drilled in 1899. Production from SRRA-administered lands for the year 1987 is listed in table 14. At production, the lease owner is required to pay a royalty on all produced oil at a maximum rate of 12.5 percent.

Federal production totals in Emery County for 1987 were 21,336 barrels of oil and 77,059 thousand cubic feet (MCF) of gas. Total 1987 production from lands administered by SRRA was approximately 44,738 MCF of gas.

The three oil and gas fields within SRRA are designated known geologic structures (KGSs). Although KGSs no longer have any official standing due to passage of Federal Onshore Oil & Gas Leasing Reform Act of 1987, they are discussed here because of their high potential for oil and gas. The three KGSs cover 66,580 public land acres in SRRA and 5,760 U.S. Forest Service (USFS) acres and vary in size from 1,520 to 129,450 acres. As of December 1987, the Ferron and Flat Canyon fields were producing, and South Last Chance field was shut-in (table 15).

There is potential for further oil and gas production from Flat Canyon field in the Wasatch Plateau, Ferron Field in Castle Valley, and South Last Chance field in the southern San Rafael Swell. These

TABLE 14

1987 Production Statistics for Federal and Nonfederal Lands

	San Rafael Resource Area				Emery County Total			
	Federal Minerals		State Minerals	Private Minerals	Federal Minerals		State Minerals	Private Minerals
	BLM	USFS			BLM	USFS		
Oil (barrels)	0	0	0	0	21,273	63	739	0
Gas (MCF)	44,738	0	0	144,567	55,244	21,815	59,084	144,567

Source: UDNR, 1987.

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TABLE 15

Oil and Gas Fields and Production Statistics

Known Geologic Structures San Rafael Resource Area	Approximate Location		Discovery Date	Acreage	Status (3/1/85)	1987 Production		Cumulative Production (as of 12/87)	
	Township	Range				Oil (barrels)	Gas (MCF)	Oil (barrels)	Gas (MCF)
Greater Ferron	15 S. 16 S. 17 S. 18, 19 S. 20, 21 S.	9, 10 E. 8, 9, 10 E. 8, 9 E. 7, 8 E. 7 E.	08/57	127,450 (Federal 65,060)	Producing	0	195,113	38,470	9,523,595
Flat Canyon	16, 17 S.	6 E.	06/53	6,600 (Federal 5,760)	Producing	124	79,992	1,545	1,452,122
South Last Chance[a]	26 S.	7 E.	02/35	1,520	Gas Shut-in	0	0	0	0
TOTAL						124	275,105	40,015	10,975,717

[a] Very remote location; no pipelines.

Source: UDNR, 1987.

fields produce from the Moenkopi Formation, the Ferron Sandstone member of the Mancos Formation, the Dakota Formation, and the Kaibab Formation. Several other formations have shows that indicate potential for future production (table 16).

Although there is no current oil production in SRRA, production has occurred in the past, and there are producing areas adjacent to the planning area; therefore, the possibility of future production from SRRA does exist.

COAL

Location and Extent of Resource

The Wasatch Plateau Coal Field and the Emery Coal Field occur within the planning area (map 18). The planning area includes the subsurface resources of the southern half of the Wasatch field, which is approximately 90 miles long and 7 to 20 miles wide, is located on the west boundary of the planning area, and extends through FPU. The Emery field, which is 6 miles wide and 35 miles long, is located in Emery and Sevier Counties about 70 miles south of Price, Utah. It covers nearly 210 square miles and is oriented northeast- southwest.

USFS manages the surface of most of the Wasatch Plateau coal field; however, under the Mineral Leasing Act, BLM is responsible for managing the coal resources and development operations. The Emery coal field underlies private and public lands.

Allocations

Before 1979, BLM allocated coal resources through known recoverable coal resource areas (KRCRAs). The Wasatch Plateau KRCRA was established in 1974 and amended in 1977. The Emery KRCRA was established in 1979. In 1979 new coal leasing regulations made all leasing competitive; since then, no new KRCRAs have been established.

KRCRAs are not used to classify areas for coal leasing; however, the Wasatch Plateau and Emery KRCRAs have been labeled as areas of high development potential. Coal of a minable thickness probably exists inside these areas.

Land use planning decisions, which include application of the coal unsuitability criteria (appendix F), identify lands within federal coal production regions that are acceptable for further consideration for leasing. The unsuitability criteria, updated in 1982 and 1983, have been applied to federal lands in the KRCRA outside Manti-LaSal National Forest (NF).

Regional coal activity planning (appendix F) will begin when the plan is complete. The regional coal team will guide leasing studies and recommend regional leasing levels and schedules to the Secretary of the Interior. If the demand will not support a regional lease sale, the region may be deactivated, or portions of it may be deleted.

The U.S. Department of the Interior (USDI) may consider applications to hold federal coal lease sales other than through the regional leasing process. There are two types of applications: (1) new leases by application outside federal coal production regions and (2) emergency lease sales, which are held when the coal is needed within 3 years to maintain production at existing mines, to meet contractual obligations, or to prevent the bypass of federal coal. Emergency lease sales may occur inside coal production regions, but leasing by application may not.

All coal leasing is by competitive bidding. Lease modifications are noncompetitive. Coal lease terms and conditions are subject to readjustment 20 years after the lease is issued and every 10 years after their first post-1976 readjustment. Leases issued before passage of the Federal Coal Leasing Amendment Act (FCLAA) are adjusted to conform to FCLAA upon their first post-1976 readjustment.

Resource Condition and Potential

Economic coal beds of the Wasatch Plateau south of Huntington Canyon lie in the Blackhawk Formation (figure 2). The Hiawatha coal seam, appearing at the base of the Blackhawk Formation, is the most prevalent and extends the length of the coal field. The Blind Canyon seam appears in the North Horn-East Mountain area and is located 50 to 100 feet above the Hiawatha seam. Several other economic coal seams appear in localized areas such as the Bear Canyon, Cottonwood, and Upper Hiawatha splits. Rock splits, igneous

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TABLE 16

Oil and Gas Production Potential

Age	Formation	Hydrocarbon Type	Location in Planning Area	Potential
Devonian	Elbert and Ouray	oil and gas	throughout	medium
Mississippian	Madison Limestone Deseret-Humbug	oil and gas	throughout	medium
	Manning Canyon	oil and gas	northern part	medium
Pennsylvanian	Paradox	oil and gas	southern and eastern parts	medium to high
Permian	Kaibab Cutler/Coconino	oil and gas tar sand		medium to high medium
Triassic	Moenkopi	oil and gas	San Rafael Swell	productive
Jurassic	Navajo Entrada	oil and gas	throughout	medium
Cretaceous	Dakota	gas	Wasatch Plateau	productive
	Mancos/Ferron	gas	Wasatch Plateau	productive

dikes, and coal wants (thinning of coal beds), render parts of the coal seams unminable. The Wasatch Plateau field has highly volatile bituminous coal with a low sulfur content.

The Emery coal field has many discontinuous beds; 13 have been defined, but only 6 achieve 5-foot thickness through the area. Coal in the Emery field is ranked as sub-bituminous.

The planning area's in-place coal reserves total approximately 2.7 billion tons [Doelling, 1972]. Actual development potential is based on several marketability factors; however, both coal fields are considered major mining districts.

Coal mining continues to be an integral part of the history of Emery and Sevier Counties. Coal was discovered in the Wasatch Plateau field in 1874. The first commercial production came the next year from mines in Huntington Canyon [Spieker, 1931]. In the next 25 years, many new mines were opened, mostly in the north end of the coal field in the Scofield and Hiawatha-Spring Canyon areas. Doelling [1972] estimates that over 70 small mines were operated at some time between 1880 and 1970 in the Wasatch Plateau south of Huntington Canyon and in the Emery coal field. All the mines south of Huntington Canyon were small operations providing coal for local space heating. This situation remained through the early 1970s.

In the 1970s, the demand for coal took a dramatic jump. In 1974, Utah Power and Light Company (UP&L) began constructing the first of five large coal-fired electricity-generating units in Emery County. Each of the five power units consumes approximately 1 million tons of coal per year. UP&L now (1988) has three large underground mines supplying coal to the three-unit Hunter generating plant near Castle Dale and the two-unit Huntington plant located at the mouth of Huntington Canyon.

Coal production levels peaked in 1982, but have fallen somewhat in the past 3 years. Production has been on a slight increase since 1986. The demand for electricity has fallen short of early 1980 projections, and oil is a strong competitor in the production of electricity. In 1985, coal production came from seven underground mines (table 17) in the planning area.

The best cumulative production estimate garnered from current figures and a 1970 estimate is 60 million tons mined from the Wasatch Plateau field south of Huntington Canyon since 1880 and 5 million tons mined from the Emery coal field since 1930 [Doelling, 1972].

As of October 1987, the planning area had 43 existing federal coal leases covering 43,800 acres; USFS manages the surface of 38 leases involving 38,800 acres.

Four coal tracts in the planning area were competitively bid and leased between 1981 and 1982. Three other tracts were offered but not sold. Nine additional tracts in the planning area were delineated but never offered. These tracts (table 18) would be likely targets for future leasing.

SRRA contains seven operating mines, including three of the largest underground coal mines west of the Mississippi River. All but one mine is operating in the Wasatch Plateau field under land managed by USFS. The planning area's main emphasis in coal management is monitoring compliance with mining and exploration plans, maximum economic recovery, coal production verification, diligence, and lease term requirements.

MINERAL MATERIALS

Location and Extent of Resource

Mineral materials, including sand and gravel, clay, building stone, fill dirt, decorative stone, crushed stone, petrified wood, and bentonitic clay, are found throughout the planning area.

The primary source for asphalt-grade material is limestone and sandstone bedrock found throughout the planning area. Material for asphalt mix is sometimes made by crushing limestone, or other suitable material is brought in from outside the area.

Stone is used for riprap on stream banks and construction projects. The stone is obtained from the Moenkopi and Cedar Mountain Formations and the Emery Sandstone member of the Mancos Shale (figure 2).

TABLE 17

Producing Coal Mines in the Planning Area

Mine Name	Operator	Federal Coal Lessee	1985 Production (tons) Federal	1985 Production (tons) Total
SUFCO No. 1	Southern Utah Fuel Company	Coastal States Energy	1,420,000	1,780,000
Emery Mine	Consolidation Coal Company	Consol & Chevron	0	300,000
Trail Mountain Mine	Diamond-Shamrock Trail Mountain Coal Company	Diamond-Shamrock	0	168,000
Wilberg-Cottonwood Mine Complex	Utah Power & Light	Utah Power & Light	280,000	[a]320,000
Des-Bee-Dove Mine Complex	Utah Power & Light	Utah Power & Light	302,000	650,000
Deer Creek Mine	Utah Power & Light	Utah Power & Light	1,970,000	2,000,000
Bear Canyon Mine	Co-op Mining Company	C.O.P. Coal Development Co.	42,000	400,000
TOTALS			4,014,000	5,618,000

NOTE: Current as of January 1986.

[a] Production figure is low because the mine is recovering from a fire.

Source: Company production records.

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TABLE 18

Coal Tracts Delineated but Not Leased

Tract Name	Acreage	Surface Managing Agency	Coal Field
Accord	120	private	Wasatch
Blue Trail	320	BLM	Emery
Emery Central[a]	2,968	BLM	Emery
Emery South[a]	748	BLM	Emery
Ferron Canyon	2,680	USFS	Wasatch
Ivie	1,040	USFS	Wasatch
North Horn[a]	21,043	USFS	Wasatch
The Pines	8,921	USFS	Wasatch
Quitchupah	9,905	USFS	Wasatch
Skumpah	640	USFS & private	Wasatch
Trail Mountain	6,950	USFS	Wasatch
Walker Flat	1,520	BLM & private	Emery
TOTAL	56,855		

[a] These tracts were offered but received no bid.

Source: BLM, 1981c.

Clay obtained from the Carmel Formation is used to stabilize sandy roads and sand dunes, while bentonitic clay from the Morrison Formation is used to line ponds and reservoirs.

Petrified wood occurs in the Chinle Formation, which crops out in SRRA. Use is incidental to recreation.

Allocations

Mineral materials are allocated through material sales or free-use permits. Currently utilized deposits of sand and gravel, clay, stone, and fill dirt are shown on maps 20, 21, and 22.

Resource Condition and Potential

The sand and gravel deposits in the planning area are generally too poor in quality to be used in asphalt or concrete, but make suitable road base material. Limestone in SRRA and FPU is of sufficient strength and density to be used in asphalt.

Common clay and bentonitic clay occurring in SRRA and FPU contain too many impurities to be useful as paper filler, ceramic clay, or bentonite for drilling mud.

The entire planning area has high potential for one kind of mineral material or another, but the particular type required for a project may not be found close to the project site.

Mining claims on large areas of SRRA effectively prevent disposal of the mineral materials present. During fiscal years 1984 and 1985, two free-use permit applications were rejected because of mining claims, and for the same reason several more applications were not filed.

Applications for sand and gravel, clay, and various types of stone make up over 98 percent of the mineral material workload in SRRA. The FPU mineral material workload is entirely attributable to sand and gravel applications.

Currently (1988), there are 35 free-use permits (2,230 acres, map 20), 4 material site rights-of-way (330 acres, map 21), and 6 community pits (800 acres, map 22) in SRRA. Production from the free- use permits in fiscal year 1987 was 164,095 cubic yards of sand

and gravel and 1,050 tons of stone; the community pits produced 100 cubic yards of sand and gravel, 160 tons of stone, and 55 tons of clay. A material sale for 2,100 cubic yards of fill dirt was held in fiscal year 1985. Although mineral materials were not produced in FPU, the area has three free-use permits (160 acres), two community pits (100 acres), and two material site rights-of-way, which have been transferred to state ownership and therefore need not be discussed here.

Community pits are areas from which members of the public can purchase small amounts of material. There are presently (1988) two designated community pits for sand and gravel, two for building stone, and two for bentonitic clay within SRRA. Two community pits for sand and gravel have been designated in FPU. The community pits were established to ensure a continuous supply of material in strategic geographic locations, where all conflicts with other resources have been resolved before material applications are received. Free-use permits are issued to nonprofit organizations and government agencies, primarily Emery County in SRRA. Material site rights-of-way are granted to the Utah Department of Transportation (UDOT) and the Federal Highway Administration for use in constructing and maintaining federal-aid highways.

Actual sales, free-use permits, and production of sand and gravel for SRRA in fiscal years 1984 through 1987 are shown in table 19. Table 20 shows Emery County's production from federal and private sources.

Small quantities of petrified wood (25 pounds per day, not to exceed 250 pounds per year) may be removed by individuals for personal use, free of charge and without a permit. There was no recorded production of either petrified wood or topsoil from SRRA in fiscal years 1984 through 1987, but approximately 279,791 cubic yards of sand and gravel and 16,474 tons of stone were produced during that time period. No mineral materials were produced in FPU.

TABLE 19

Mineral-Material Production in the Planning Area

	Fiscal Year			
Method of Disposal	1984	1985	1986	1987
Mineral material sales (cubic yards)	0	2,100	0	[illegible]
Community pit production				
Sand and gravel (cubic yards)	117	400	1,050	100
Stone (tons)	72	44	80	100
Clay (tons)	0	0	80	55
Free-use permits				
Volume permitted				
Sand and gravel (cubic yards)	300,000	500,000	900,000	390,000
Stone (tons)	9,000	26,000	50,000	0
Volume produced				
Sand and gravel (cubic yards)	11,300	22,300	82,096	164,095
Stone (tons)	2,200	1,200	14,224	1,050

Source: SRRA files.

TABLE 20

Mineral-Material Production by Emery County

Fiscal Year	Sand and Gravel (cubic yards)		Stone (tons)	
	Private	Federal	Private	Federal
1984	29,082	11,300	0	2,200
1985	49,505	22,300	0	1,200
1986	N/A	82,096	N/A	14,224
1987	N/A	164,095	N/A	1,050
TOTAL	78,587	279,791	0	18,674

NOTE: N/A = data not available.

Source: SRRA files; letter from Emery County Road Department dated June 27, 1986.

LOCATABLE MINERALS

Location and Extent of Resource

Locatable minerals found in the planning area include uranium, vanadium, gypsum, and copper, of which uranium, vanadium, and gypsum are the most frequently claimed.

Uranium and vanadium are found in the Morrison and Chinle Formations (figure 2). The Morrison Formation crops out around the flanks of the San Rafael Swell and in the northern part of the San Rafael Desert. The Chinle Formation crops out in the San Rafael Swell and along the Green River. In this area, uranium and vanadium deposits are usually small, scattered ore bodies of less than 10,000 tons.

Gypsum is found in the Carmel and Summerville Formations (figure 2), which crop out on the flanks of the San Rafael Swell and in the central and southern parts of the San Rafael Desert. Beds of pure or nearly-pure gypsum up to 11 feet thick occur in these formations.

One small body of copper occurs in the Navajo and Kayenta Sandstones of the San Rafael Swell.

Exploration and mining for uranium and vanadium occurred in previous decades in the San Rafael Swell area.

Allocations

Locatable minerals are allocated through location of mining claims. Exploration can take place without a claim, but an unclaimed discovery would be pre-empted by location of a claim. A mining claimant can apply for a patent on an unpatented mining claim. A patented mining claim is owned by the claimant and is no longer part of the public domain.

By law, all public lands are open to mineral entry (mining claim location) unless specifically segregated or withdrawn. Withdrawals are made at the USDI level, but may be in response to a recommendation originating at the resource area.

Lands are segregated in response to applications for certain forms of land disposal. The purpose of a segregation from mineral entry, if applied, would be to prevent new mining claim locations from clouding title to lands that are to be classified for disposal or another specified purpose, since a mining claimant has an inherent right to carry to surface patent. This type of allocation is generally in small, scattered tracts and cannot be anticipated through the planning process.

Withdrawals of land from appropriation under the mining laws are governed by Section 204 of the Federal Land Policy and Management Act (FLPMA) of 1976. Only the Secretary of the Interior, the President, or the Congress can withdraw public lands. A withdrawal generally covers a large area set aside for a specific purpose, such as Capitol Reef National Park (NP). The land is withdrawn from mineral entry to protect certain resource values from the effects of mining or to prevent land from passing from federal ownership through patent. While withdrawals are beyond the resource area manager's discretion, the RMP can serve as a basis for recommendations through administrative channels that lands be withdrawn from mineral entry.

Over 19,000 mining claims have been located in SRRA, about 17 in FPU. Approximately 2,110 acres in the planning area have been withdrawn from mineral entry; the remainder is open or partially open to entry (map 23). Tables 21 and 22 compare management categories in the planning area to potential for occurrence of uranium and gypsum.

TABLE 21

Comparison of Management Category and Uranium Potential

	Potential for Occurrence (acres)			
	SRRA		FPU	
Management Category	High	Moderate Low or None	High	Moderate Low or None
Open	334,250	1,093,460	7,200	68,150
Open[a]	24,840	9,180	0	0
Closed[b]	0	2,110	0	0
TOTAL	359,090	1,104,750	7,200	68,150

[a] Powersite withdrawals. [b] Recreation and Public Purpose Leases.

~~Source: Master~~ Title Plats; UDOT, 1971.

TABLE 22

Comparison of Management Category and Gypsum Potential

	Potential for Occurrence (acres)					
	SRRA			FPU		
Management Category	High	Moderate	Low or None	High	Moderate	Low or None
Open	291,260	457,850	670,890	6,860	14,300	54,010
Open[a]	0	13,560	20,460	0	0	0
Closed[b]	2,100	1,600	4,010	40	60	80
Closed[c]	10	710	1,390	0	0	0
TOTAL	293,370	473,720	696,750	6,900	14,360	54,090

[a] Powersite withdrawals. [b] Public water reserves.

[c] Recreation and public purpose Leases.

~~Source: Master~~ Title Plats; UDOT, 1971.

Resource Condition and Potential

The uranium and vanadium ore bodies range in size from a few tons to over 100,000 tons, but most contain fewer than 10,000 tons. Most ore bodies are either tabular or cylindrical [Hawley, et al., 1965; Hawley, et al., 1968; Trimble and Doelling, 1978].

There is high potential for uranium development where the Morrison and Chinle Formations occur under less than 1,000 feet of overburden; development potential is medium to low where these formations occur at deeper levels (map 79).

Gypsum occurs as large sheets extending for many miles. Several million tons of gypsum probably occur in each deposit. Trimble and Doelling [1978] estimated that 20 million tons of gypsum occur in the San Rafael River area alone.

Development potential for gypsum is high where the Summerville and Carmel Formations contain known gypsum beds 4 or more feet thick under less than 1,000 feet of overburden; gypsum development potential is medium where these formations occur at the same depth but gypsum beds are not known to occur. Development potential for gypsum is considered low where the Summerville and Carmel Formations are deeper than 1,000 feet (map 80).

There are no known gold deposits in the planning area; therefore, the occurrence of gold is not addressed.

Strategic and critical minerals and metals occurring in the planning unit include copper, manganese, and vanadium. The only known occurrence of copper in the planning area is a small deposit at the Copper Globe mine, located on the west flank of the San Rafael Swell. A few small, scattered, low-grade manganese deposits reportedly occur in the planning area. Vanadium, produced as a by-product of uranium, is the only strategic or critical mineral or metal that has been produced in the planning area in any quantity. However, since no uranium is currently being produced, neither is vanadium.

Areas of high potential for uranium and gypsum occurrence cover about 575,000 acres; about 75 percent of the planning area has some potential (low to high) for either uranium or gypsum. As shown in tables 21 and 22, approximately 34,000 acres in the planning area under powersite withdrawals were opened to mineral entry under the Mining Claim Rights Restoration Act of 1955. Some 7,710 acres in SRRA are segregated from entry as public water reserves (PWRs), 180 acres in FPU (map 23).

Because mining claimants have the right to prospect for locatable minerals and locate mining claims without government approval, BLM's involvement in the location process for locatable minerals is minimal. Mining claims are recorded and adjudicated at USO. Resource area personnel process notices of intent for projects that would disturb 5 acres or less and process and approve plans of operation where more than 5 acres would be disturbed; they also perform mining claim validity examinations.

USFS manages mining claims on the Fishlake and Manti-LaSal NFs in much the same way as BLM manages claims on public land. The BLM USO records mining claims on USFS lands, and USDI has paramount responsibility for these claims. USFS processes notices of intent and plans of operation for exploration or mining on claims and initiates any contest complaints against the claims. The resource area has essentially no involvement in surface management of mining claims located on USFS lands, unless requested.

Capitol Reef NP was withdrawn from mineral entry in 1971. Most of the claims existing at that time have been either dropped by the claimants or invalidated. Two mining claims are presently (April 1988) located within the park. Access to mining claims that lie outside the park can be obtained through the park only on designated roads, on foot, or with pack animals.

Exploration and mining for uranium and vanadium occurred in previous decades in the San Rafael Swell area. Open mine tunnels carry the potential for exposure to radon gas and the resulting radioactive radon daughters. In a preliminary field survey of potentially hazardous sites in SRRA, Hare and Day [1986] identified approximately 100 open mine tunnels (table 23).

The first uranium ore mined in SRRA was taken from Temple Mountain in 1914. Only small amounts were removed until 1948, but between 1948 and 1956, 1,287,000 pounds of uranium oxide and 3,799,000 pounds of vanadium oxide were produced from the San Rafael Swell [Hawley, et al., 1965]. The Delta/Hidden Splendor mine, the largest in SRRA, was discovered in 1952 and produced over 100,000 tons of ore. The Lucky Strike mine, discovered in 1949, had produced over 10,000 tons of ore by 1957 [Hawley, et al., 1968].

Demand for uranium was small until late 1965 when nuclear powerplants began to be planned and built across the United States. Nuclear power use has since declined, contributing to a downturn in the uranium market. In addition, foreign producers have been flooding the market with low-cost uranium. Essentially no production of uranium from the planning area has occurred since 1985.

TABLE 23

Hazardous Areas Identified in San Rafael Resource Area

Name of Area	Open Portals	Radon Hazard	Mine Shafts	Open Holes
Reds Canyon	x	x		x
Flat Top and Temple Mountain	x	x	x	x
Rods Valley	x	x		x
Head of Sinbad	x	x		x
Muddy Creek	x	x		x
Cistern, Bell, Chute, and Crack Canyons	x	x		x
Wild Horse Mesa	x	x		x
San Rafael Reef	x	x		
San Rafael Desert				x
Coal Wash, McCarty, Saddle Horse, and Virgin Spring Canyons	x	x		x
Bottleneck Peak	x	x		
Jessie's Twist and Horse Bench			x	x

Source: Hare and Day, 1986.

To date (1988), uranium properties have been developed only where surface exposures of the Morrison and Chinle Formations occur, such as in canyon walls or on cliff faces. Most production has been from the Temple Mountain, Delta/Hidden Splendor, and Lucky Strike mines. Known uranium mines and surface exposures of the Morrison and Chinle Formations are shown on map 79.

No gypsum is currently (1988) being produced in the planning area, but two gypsum mines have been proposed in the Chalk Hills area to produce rock dust for use in coal mines. The manufacture of wallboard could be another potential gypsum market.

Copper occurs in the Navajo and Kayenta Sandstones. A small copper deposit was discovered in the late 1800s south of what is now Highway I-70 east of Sagebrush Bench. Three shipments of ore were removed during World War I, and additional ore was removed during World War II, but the quantity and grade are unknown. The mine currently (1988) produces small quantities of copper for jewelry and mineral specimens.

BIOTIC COMPONENTS

SOILS

Location and Extent of Resource

Soils in the planning area are described in the soil survey of the Emery County area, which covers portions of Emery and Sevier Counties. This manuscript is scheduled for final correlation in 1989. Copies of the completed soil maps and draft manuscript may be reviewed in the Moab District and SRRA offices.

Badland and gypsumland, natural sources of large amounts of salt and sediment, lack vegetation but frequently have a thin mantle of hard shale or rock fragments or cryptogamic cover, which provides some stability and helps prevent surface erosion.

The planning area has an estimated 637,770 acres of soils with surface textures that are highly susceptible to water erosion; these soils cover about 611,350 acres in the grazing area. The surfaces of these soils generally have a high proportion of fine sands or silts with little binding material. When the vegetation on these soils is removed by surface disturbance, fire, or heavy grazing pressure, the soils are subject to erosion. Vegetation disturbance on these soils could result in erosion rates of 10 to 15 tons per acre per year. Estimated soil loss, sedimentation, and salinity under current management are shown in table 24.

The planning area has an estimated 467,060 acres of soils that are highly susceptible to wind erosion; these soils cover about 556,750

TABLE 24

Current Soil Loss, Sediment Loading, and Salt Loading

	Acres		Current Management (tons per acre per year)		
Soils Category	Planning Area	Grazing Area	Soil Loss	Sediment Loss	Salinity
High potential for contributing salt and sediment	613,320	591,750	6.5 to 37.5	2.9 to 15	0.052 to 0.26
High susceptibility to wind or water erosion when disturbed	1,104,830	1,168,100	3.5 to 37.5	1.4 to 15	0.0041 to 0.26
High runoff potential	1,047,250	1,053,480	3.5 to 37.5	1.3 to 15	0.0039 to 0.27
High Potential for Loss in vegetation productivity under high rates of wind or water erosion	332,150	389,190	0.7 to 8.8	0.29 to 3.5	0.00085 to .01

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acres in the grazing area. These soils have a very high proportion of sands and little binding clay or organic matter. Under conditions of prolonged drought or large-scale surface disturbance, wind erodes these soils; structures such as fences, cattleguards, roads, and reservoirs can be damaged, covered, or removed by this erosion.

The planning area has an estimated 1,047,250 acres of soils that have a high runoff potential; these soils cover an estimated 1,053,480 acres in the grazing area. These soils consist chiefly of clays and shallow soils to bedrock or hardpan, badlands and rock outcrops. They have very slow infiltration rates when thoroughly wetted.

Approximately 9,930 acres of soils in the planning area and 18,380 acres in the grazing area occur along floodplains of major stream channels and are subject to flooding for some period of time. In addition, many small drainages are subject to infrequent flash flooding during intense localized convective storms. Approximately 15,530 acres in the planning area and 16,030 acres in the grazing area are subject to occasional flash floods. Many of these drainages have deeply incised cutbanks. Current estimates indicate that between 7,135,900 and 60,414,500 tons of soil per year are being lost.

Approximately 157,430 acres in the planning area and 145,420 acres in the grazing area could qualify as prime farmland if a dependable water supply were available in 7 out of 10 years. Currently a dependable supply is not available.

Allocations

Soil use, while not directly allocated, is an inherent part of any land development activity.

Resource Condition and Potential

The arid climate has affected soil development in the planning area. Soils developed in alluvium, residuum, and aeolian material contain little organic matter.

Soils developed on marine formations are high in gypsum and other salts. High concentrations of these salts at or near the soil surface limit the types and amounts of vegetation present. These areas are also major diffuse sources of salt and sediment to the Colorado River system.

Salt and sediment yield is of major concern in the Colorado River basin, and erosion from public lands is an important source of sediment and associated salts in the planning area. Some of this is natural or results from relatively stable conditions in an arid or semiarid climate with periodic high-intensity storms.

The actual contribution of salt and sediment yield to the total Colorado River basin from drainages in the planning area is unknown.

Many shallow soils and those with horizons high in gypsum have a cryptogamic cover and are therefore sensitive to surface disturbance. Critical soils contain very highly saline soils and/or are very highly susceptible to water erosion. Critical soils encompass 565,280 acres in SRRA, 9,040 acres in FPU, and 544,130 acres in the grazing area (map 69). Some soils in the planning area are at or near their potential for producing vegetation, but may not be at potential for plant species composition of potential natural communities (PNCs).

Watershed resources consist of the interaction between soils and water. The condition of the soil surface (including vegetation) largely determines the amount of runoff from an area.

Critical watershed areas include soils that (1) have a high potential for salt yield; (2) are subject to severe water and wind erosion when distrubed; (3) have high runnoff potential during storm events; (4) are subject to frequent flooding; or (5) have a potential for loss of vegetation productivity under high rates of wind or water erosion. Critical watersheds encompass 1,013,560 acres in SRRA, 63,060 in FPU, and 1,131,240 in the grazing area (map 70).

The condition of a drainage includes the present channel geometry and the streambed characteristics. Stable drainages tend to have well vegetated banks and streambeds that are stable in bedrock, without steep or deeply incised banks. Unstable drainages show evidence of recent downcutting and gullying. There has been no inventory of drainage conditions in the planning area. Activity plans were written for Muddy Creek, Cottonwood, and Ferron Creek watersheds. No activity plan is currently in effect (1988) for the San Rafael drainage.

WATER

Location and Extent of Resource

Most of the planning area is within the upper Colorado River basin and includes portions of three smaller drainage basins: the San Rafael, Dirty Devil, and Green Rivers. About 800 acres in the northwestern part of the FPU are within the Sevier River drainage basin, which leads to Sevier Dry Lake. The surface of the planning area is divided among the four drainage basins approximately as follows: San Rafael River basin, 54 percent; Dirty Devil River basin, 40 percent; Green River basin, 6 percent; and Sevier River basin, less than 1 percent.

Concerned agencies, including U.S. Geological Survey (USGS) and the State of Utah and others have established a gauging network on the San Rafael River and Muddy Creek and their major tributaries to monitor salt content and compliance with water quality standards on major stream segments.

Waters in the planning area are used primarily for agricultural, municipal, and industrial purposes. Recreationists and fish and wildlife are also important users but, as a rule, do not consume appreciable quantities of water. Stock watering is also important. If water for livestock is not otherwise available, it is developed, but quantities are not great.

The following municipal watersheds cover a total of 14,070 acres in SRRA: Huntington, Cleveland and Elmo, which derive water from Huntington Creek; Castle Dale and Orangeville, which derive water from Cottonwood Creek; and Ferron, Clawson and Molen, which derive water from the Millsite Reservoir on Ferron Creek.

Allocations

Water rights are established by state law. BLM participated in four adjudications of state water rights which cover the planning area. The RMP cannot be used to determine water rights, but it may be used as a basis to develop future uses for water in the planning area.

Resource Condition and Potential

Water quality is the measurement of physical, chemical, and biological parameters of the streams in the area. The target parameters are set by state and federal regulations for particular stream segments or particular water uses. State water quality standards have been exceeded at several stations and reported by the Environmental Protection Agency (EPA). Short-term variances also occur.

Most surface water in the planning area flows from USFS land on the Wasatch Plateau. The perennial streams (Green River, San Rafael River, Muddy Creek, and Salina Creek) and their major tributaries are diverted for irrigation. During the summer most of the water in San Rafael River and Muddy Creek is return flow from irrigation. Surface water quality in most of the planning area is poor, with high total dissolved solids (TDS) levels and heavy sediment loads.

Irrigation return flow adds to the salinity problem. When the San Rafael River and Muddy Creek are diverted for irrigation, return flows are saline.

Runoff from public lands tends to accumulate salts and sediment and transport them into the main drainages during storms, adding to the salt content of San Rafael River and Muddy Creek.

The planning area is estimated to have sedimentation rates of about 0.5 to 8 tons per acre per year (0.2 to 3.0 acre-feet per square mile per year). Sediment yield is therefore between 2,854,230 and 24,165,810 tons per year.

Over 20 percent of the upper Colorado River basin's salt load comes from public lands; most of it from surface or near-surface transport of salt from saline geologic formations and saline soils.

Activity plans may be required to bring some planning area stream segments up to state standards.

Ground water quality is highly variable, depending on the formation in which the aquifer is located and on the well location.

Ground water contamination is a continuing concern. Fresh water in the Navajo Formation is contaminated with high levels of TDS where this formation is exposed next to San Rafael River and Muddy Creek. Activities such as mining or drilling have the potential to contaminate this and other fresh-water aquifers.

Most ground water recharge occurs from areas of irrigation return flow and near the USFS boundary. Larger and more consistent quantities of water and a greater number of water sources are in demand, particularly for wildlife and livestock. More water sources could help to redistribute livestock and wildlife and assist in range management.

The natural water resource functions of riparian areas must be protected. These include (1) floodplain protection; (2) vegetation stabilization for stream bank stability; (3) providing a buffer strip for water purification; (4) raising the ground water table; and (5) regulating water temperature.

AIR QUALITY

Location and Extent of Resource

All of the planning area is included in the Upper Colorado River airshed, bounded on the west by the Wasatch Plateau and Range and on the north and east by the Roan Plateau and Rocky Mountains.

Allocations

Since the entire planning area is in attainment with national ambient air quality standards (NAAQS), the air resource can be allocated by prevention of significant deterioration (PSD) classifications (table 25) and visibility protection regulations. Changes in PSD classifications, generally from class II to class I, could result from a state or congressional decision. Visibility protection could be required as a result of any state regulations that might be formulated.

TABLE 25

Prevention of Significant Deterioration Increments

Pollutant	Averaging Time	Maximum Allowable[a] Concentrations	
		Class I	Class II
Sulfur dioxide	annual	2	20
	24-hour	5	91
	3-hour	25	512
Total suspended particulates	annual	5	19
	24-hour	10	37

[a] Micrograms per cubic meter.

Source: Aerocomp, Inc., 1984.

The entire planning area is a class II air quality area. However, Capitol Reef NP, adjacent to the planning area, as well as Canyonlands and Arches NPs, near the planning area, are class I areas and therefore protected against air quality degradation. The class I designation prevents any activity that would allow sulfur dioxide or particulate matter concentrations to exceed allowable limits in the parks. Visibility considerations can also restrict activities affecting class I areas.

The State of Utah considered integral vista designations. The Secretary of the Interior declined to name any integral vistas, stating that the states could adequately make any needed designations themselves [Federal Register Vol. 51, No. 15, January 23, 1986, Page 3048]. The state has opted, in their final rulemaking, not to identify or protect integral vistas or scenic views.

The RMP does not play a part in PSD classifications or integral vista designations.

Resource Condition and Potential

The planning area's air is clean because populations are small and spread out and because industrial activity is somewhat limited.

Powerplants in the planning area are major polluting sources as defined by the State of Utah. Construction, road development activity, and sand and gravel operations are potential sources of particulate matter. Particulate concentrations can be a local problem but are not considered major polluting sources.

BLM evaluates potential impacts to air quality from proposed activities by considering topographic or airshed features, atmospheric stability, mixing height, average wind speed through the mixed layer, and the interaction of these variables. Management of polluting activities requires a balance between protection of air quality and perpetuation of multiple-use resource development.

Air quality above the public lands has an influence on and is influenced by activities on public lands, and on other adjoining federal, state and private lands.

Generally, air quality for the area is good. The entire planning area is an attainment area with respect to NAAQS. NAAQS (table 26) are exceeded occasionally when strong winds suspend high concentrations of particulate matter. Such wind-blown dust is considered natural to the area does not constitute a violation of NAAQS.

Concentrations of various pollutants are predictably higher near towns and industrial facilities. Site-specific data are available in three major EISs that cover the planning area [BLM, 1977b; BLM, 1979b; USGS, 1979]. Ambient concentrations for San Rafael Swell are shown in table 27.

TABLE 26

Applicable State and Federal Ambient Air Quality Standards

Pollutant		Averaging Time	Standard[a]
Sulfur dioxide	Primary	annual	80
		24-hour[b]	365
	Secondary	3-hour	1,300
PM-10[c]	Primary	annual	50
		24-hour[b]	150
	Secondary	same as primary	
Ozone		1-hour[d]	235
Nitrogen dioxide		annual	100
Lead		0.25 year	1.5
Carbon monoxide[e]		8-hour	10,000
		1-hour	40,000

[a] In micrograms per cubic meter unless otherwise noted.

[b] Not to be exceeded more than once per year.

[c] Particulate matter less than 10 microns in size.

[d] Expected number of days in a calendar year with maximum hourly values above 235 cannot exceed one.

[e] Milligrams per cubic meter.

Source: NPS and BLM, 1984.

TABLE 27

San Rafael Swell Ambient Air Quality Concentrations

	24-Hour Maximum	Annual	1-Hour	8-Hour	1-Hour Maximum
Total suspended particulates	90	19			
Sulfur dioxide	13	13			
Nitrogen dioxide		13			
Carbon monoxide			-	-	
Ozone					132

Source: Aerocomp Inc., 1984.

A major polluting source is one that emits more than 100 tons of a pollutant per year. Major polluting sources in the planning area would include the Huntington powerplants, which were built and operating before PSD regulations were adopted and therefore not considered under PSD review. Hunter units 1 and 2 are also major polluting facilities, but elected to implement scrubbing technology that allowed them to avoid PSD review and permitting. Hunter unit 3 did trigger PSD review; the unit was permitted by the State Bureau of Air Quality. Unit 3 is consuming allowable class II increments of both sulfur dioxide and total suspended particulates (TSP). Other sources that occur in the designated impact area around unit 3 will also consume increment above the background concentrations established for that area [Dave Kopta, Manager of Engineering, Utah Bureau of Air Quality, personal communication, August 1986].

In addition to the three nearby class I areas, BLM has identified four other areas as being of special interest in relation to air quality [BLM, 1979a; BLM, 1979b; and USGS, 1979]. The four special interest areas include Sids Mountain, Mexican Mountain, San Rafael Reef, and the lower Green River. Visibility protection was the reason for interest in these areas, because they are considered scenic and isolated [USGS, 1979].

Visual range from Cedar Mountain was reported to be 128 miles [Aerocomp Inc., 1984]. Actually, visibility varies considerably throughout the year. National Park Service data collected at Capital Reef National Park shows distinct differences between seasons. Their data is summarized in percentiles. For the 50th percentile, visual range is less than or equal to a particular value 50 percent of the time. Averaging 50th percentiles from 1978 to 1987 gives the following seasonal differences: 112 miles for spring, 145 miles for winter, 118 miles for fall, and 102 miles for summer. [Bill Malm, National Park Service (NPS) Air Quality Specialist, personal communication, 1988.]

The San Rafael Management Framework Plan (MFP) [BLM, 1979a] sets a goal to protect and enhance air quality of San Rafael Swell by managing it to maintain present visual quality. Although BLM cannot change an area's air quality class, the MFP discussed managing the swell as a class I area. However, for economic reasons associated with restricted industrial growth, the MFP opted to work within visual air quality class II requirements to maintain the high visual quality existing at that time. Class II regulations require the use of best available control technology, which could be used to obtain tighter control than would normally be required for class II areas if visibility is identified as needing that additional protection [Bill Wagner, Natural Resource Specialist, BLM USO, personal communication, July 1986].

VEGETATION

Location and Extent of Resource

Vegetation has been mapped for the San Rafael grazing area, which lies within parts of three defined geographic regions: the Colorado and Green River Plateaus; the Central Desertic Basins, Mountains, and Plateaus; and the Wasatch and Uinta Mountains (map 81).

The San Rafael Desert falls within the Colorado and Green River Plateaus area, a 6 to 12-inch precipitation zone where the vegetation includes blackbrush and grassland.

The majority of the grazing area falls within the Central Desertic Basins, Mountains, and Plateaus area, a 6 to 9-inch precipitation zone where the vegetation is primarily pinyon-juniper and saltbush.

The western side of the grazing area falls within the Wasatch and Uinta Mountains area, a 15 to 18-inch precipitation zone where the higher elevations support mostly woodlands, timber (Douglas fir, limber pine), and aspen.

Distribution of vegetation types within the grazing area can be attributed primarily to a combination of climatic, edaphic, and topographic factors. Water availability and soil composition are particularly important. Altitude changes between valley floors and plateau tops also affect vegetation; saline and alkaline soils influence plant growth.

Four known areas of isolated, relict plant communities developed without the influence of domestic livestock grazing exist in the SRRA. The areas of Bowknot Bend (1,830 acres), North Big Flat Top (190 acres), Hebes Mountain (960 acres) and the San Rafael Reef (43,870 acres) have potential value for scientific study and for comparison with similar vegetation communities that have been grazed.

Allocations

Specific vegetation uses allocated are forest product use and grazing, both described later in this chapter. For this RMP, vegetation in the San Rafael Grazing Area is classified into seven vegetation zones: blackbrush, pinyon-juniper, sagebrush, grassland, salt shrub, vegetation manipulations, and miscellaneous landforms (map 81).

Although a few small areas in the northwestern portion of the grazing area are dominated by the conifer vegetation type or the greasewood vegetation type (found mainly on valley floors and floodplains), these areas are not shown on map 81.

Blackbrush

Blackbrush (Coleogyne ramosissima) is found in the San Rafael Desert. Blackbrush and related plants are thought to be survivors of older groups that were once more widespread [Bowns and West, 1976]. Other plants associated with blackbrush are Indian ricegrass, galleta, and Mormon tea.

Pinyon-Juniper

The pinyon-juniper associations inhabit semidesert and upland zones throughout the grazing area. The dominant species are Utah juniper (Juniperus osteosperma) and pinyon pine (Pinus edulis). The most common understory shrubs are shadscale (Atriplex confertifolia) and Mormon tea (Ephedra spp.). Major grasses are galleta (or curlygrass) (Hilaria jamesii), blue gramma (Bouteloua gracilis), Indian ricegrass (Oryzopsis hymenoides), and sand dropseed (Sporobolus cryptandrus) [BLM, 1978]. The perimeter, or ecotone, of the pinyon-juniper type comprises a mixed association of shrubs such as sagebrush or grassland/sagebrush. Open stands provide forage for livestock and wildlife, while closed stands usually provide little more than cover.

Sagebrush

The sagebrush vegetation zone occurs on the drier portions of the pinyon-juniper zone and the wetter fringes of the salt shrub zone. The major species are big sagebrush (Artemisia tridentata var. tridentata), Wyoming sagebrush (A. tridentata var. wyomingensis), and Bigelow sagebrush (A. bigelovii).

Grassland

The grassland zone includes both desert and semidesert zones. Grasslands within the area consist primarily of perennial grasses intermixed with shrubs and annual grasses. The dominant grass species are Indian ricegrass, galleta, and blue gramma. Other grasses include sand dropseed, threeawn (Aristida spp.), needle-andthread (Stipa comata), squirreltail (Sitanion hystrix), and western wheatgrass (Agropyron smithii).

Salt Shrub

The salt shrub zone is characterized by low-growing shrub communities, which frequently occur in saline-alkaline soils at lower elevations. Dominant species are shadscale; Castle Valley clover (Atriplex cuneata); mat saltbush (A. corrugata); fourwing saltbush (A. canescens); wedgeleaf nuttal saltbush (A. nuttallii cuneata); and winterfat (Ceratoides lanata). Galleta and Indian ricegrass are the most important understory plants; both are salt-tolerant.

Vegetation Manipulations

Vegetation manipulations are areas where humans have changed the vegetation through chaining, plowing and seeding, or contour furrowing. Plant species that were introduced vary from project to project.

Miscellaneous Landforms

Miscellaneous landforms include badlands, rock outcrop, gypsumland, duneland, rubbleland, and riverwash. These are areas where conditions are so severe that only sparse vegetation exists. These areas are unstable and unproductive; they have low forage value for livestock or wildlife and minimal potential for improvement.

Threatened or Endangered Plant Species

The grazing area contains several endangered, threatened, or sensitive plants. The U.S. Fish and Wildlife Service (USFWS) lists broad areas of recognized habitat for T/E species in the Federal Register. Because of danger of illegal collection, USFWS has not designated any critical T/E plant species habitat within the planning area. Species listed or officially proposed for listing and species recognized by the state are afforded special management consideration. When the species is proposed for listing as T/E, BLM treats it as though it had already received T/E status under the 1973 Endangered Species Act. Protected plant species are listed in table 28.

Resource Condition and Potential

A range inventory between 1983 and 1985 determined ecological status of the grazing area. Ecological status can be summarized as follows: 9 percent early seral stage; 47 percent mid-seral; 22 percent late seral; and 9 percent PNC.

All ecological sites would naturally progress toward PNC with the absence of disturbance. However, between now and the year 2000, little change in ecological status would be evident if all human influences were removed from the rangelands. This lack of change is due primarily to the short time frame involved (12 years). Plant vigor and density may increase, but species composition would be slower to change. As well, wildlife grazing and natural occurring disturbances (such as fire, flood, drought) would inhibit the natural succession toward the potential natural community in some areas.

FOREST PRODUCTS

Location and Extent of Resource

There are about 414,950 acres of forested land in the SRRA and about 36,320 acres in the FPU. Only noncommercial forest products sales occur in the SRRA. Commercial fuelwood areas have been established in the FPU. The predominant species are pinyon and juniper, which can be used for fuelwood, fence posts, and Christmas trees and have additional value for watershed, wildlife habitat, recreation, and visual resources. Pinyon nuts are also produced in the planning area.

Under each alternative, the planning area is divided into three management categories for forest products: (1) lands available for restricted management of forest products (extensive management areas); (2) lands where forest products would be managed for the enhancement of other uses; and (3) lands not available for management of forest products.

All forested areas in the planning will be treated as extensive woodland management areas. When additional inventory work is completed, extensive management areas will be further refined and the lack of intensive management areas will be verified. Under current management (map 40) there are no areas where forest products are managed for the enhancement of other uses.

TABLE 28

Status of Threatened, Endangered, or Sensitive Plants

Common Name	Status	Scientific Name	Known to Occur in Planning Area	Habitat Use
Maguire daisy	Endangered	*Erigeron maguirei*	Yes	N/A
Wright fishhook cactus	Endangered	*Sclerocactus wrightiae*	Yes	N/A
Jones cycladenia	Threatened	*Cycladenia humilis* var. *jonesii*	Yes	N/A
Last Chance townsendia	Threatened	*Townsendia aprica*	Yes	N/A
San Rafael cactus	Threatened	*Pediocactus despainii*	Yes	N/A
Silver milkvetch	Sensitive	*Astragalus subcinereus* var. *basalticus*	Yes	N/A
Smith wild buckwheat	Sensitive	*Eriogonum smithii*	Yes	N/A
Yellow blanket flower	Sensitive	*Gaillardia flava*	Yes	N/A
Western sweetvetch	Sensitive	*Hedysarum occidentale* var. *canone*	Yes	N/A
Hymenoxys	Sensitive	*Hymenoxys depressa*	Yes	N/A
Jones indigo bush	Sensitive	*Psorothamnus polyadenius* var. *jonesii*	Yes	N/A
Barneby schoenocrambe	Sensitive	*Schoenocrambe barnebyi*	Yes	N/A
Globemallow	Sensitive	*Sphaeralcea psorgloides*	Yes	N/A

Source: *Federal Register* Vol. 50, No. 181, September 18, 1985, pp. 37958 to 37967 and Vol. 51, No. 86, May 5, 1986, pp. 16526 to 16530.

Allocations

Forest products in demand are sold by permit. In the planning area, fuelwood and Christmas trees are the forest resources most in demand; post permits have also been sold. Areas subject to forest product use are shown on map 41. There is little interest in commercial use in SRRA, but such interest has been expressed in FPU.

Until 1983 BLM issued free-use permits for collection of dead wood. Present BLM policy is to sell forest products that are in demand, by bid or permit. Green wood is usually offered for sale by bid to establish fair market value. Live specimen plants are also sold by permit. Pinyon nuts are free if gathered for personal consumption; otherwise, they are subject to permit.

Historically, the harvest of forest products in SRRA has been limited to gathering dead fuelwood from specific chained areas. Since 1985, a small area south of Highway I-70 has been open for Christmas tree cutting (map 41). Post cutting is presently (1988) not allowed. Many of the trees are stunted or poorly formed, making them unsuitable for this use.

In FPU, green fuelwood can be cut only in designated areas. The entire FPU is open to harvest of dead and downed wood and Christmas trees. Post cutting is allowed in designated green wood cutting areas. Commercial fuelwood areas have also been established in FPU (map 41).

The average harvest in FPU is 330 cords per year. Up until 1987, the average harvest was 70 cords per year. However, in 1987, commercial areas were open ahead of a chaining project.

Both dead and live wood exist on the same acreage. Under current management, harvest has not exceeded 60 cords per year in SRRA and has occurred on less than 1 percent of the forested area each year.

Resource Condition and Potential

The planning area has a large enough supply of woodland products to meet current public demand.

About 8,000 acres of pinyon-juniper chainings (less than 1 percent of the planning area) are susceptible to pinyon-juniper invasion (map 81).

A few small areas in the northwestern part of the planning area are dominated by the conifer vegetation type. Ponderosa pine (*Pinus ponderosa*) and Douglas fir (*Pseudotsuga menziesii*) occur on the west boundary of the planning area. The portion on BLM land is too small for commercial cutting.

The BLM has authority to identify and establish areas for use under various types of sales.

No forest development projects are planned or currently in progress (1988) in SRRA. In FPU, three vegetation manipulations totaling 2,600 acres are in various stages of implementation in the Rock Springs, Deer Peak, and Willow Springs Allotments.

WILD HORSES AND BURROS

Location and Extent of Resource

In SRRA, 475,680 public land acres are within the wild horse and burro herd management area (table 29 and map 42). Of these acres, 399,130 are wild horse range and 76,550 are wild burro range. Within these areas, 178,090 acres are considered critical. Critical wild horse range includes 142,240 acres of public land, wild burro critical range 35,850.

Wild horses and burros in SRRA are most likely descendants of horses and burros left by early travelers on the Old Spanish Trail, as well as horses turned out with the advent of the automobile and

TABLE 29

Wild Horse and Burro Herd Unit Acreages, by Grazing Allotment

Herd Management Area and Unit	Grazing Allotment	Kind of Animal	BLM Acres		
			Yearlong	Critical	Total
Robbers Roost (UT-653)	Iron Wash	Horses	3,490		3,490
Flat Top	Jeffery Well	Horses	17,430		17,430
	Moonshine	Horses	8,060	3,610	11,670
	Pasture Canyon	Horses	22,350		22,350
	Sweetwater	Horses	48,560	17,470	66,030
ROBBERS ROOST TOTAL			99,890	21,080	120,970
Muddy Creek (UT-651)	Globe Link	Horses	730		730
Globe Link	Last Chance	Horses	380		380
	Lone Tree	Horses	34,380		34,380
	Mussentuchit	Horses	32,580		32,580
	South Sid & Charley	Horses	1,930		1,930
SUBTOTAL			70,000		70,000
Globe Link[a]	Globe Link	Horses		5,770	5,770
	Lone Tree	Horses		22,620	22,620
	South Sid & Charley	Horses		1,300	1,300
SUBTOTAL				29,690	29,690
Globe Link[b]	Lone Tree	Horses		6,420	6,420
	Mussentuchit	Horses		1,310	1,310
SUBTOTAL				7,730	7,730
Globe Link[c]	Lone Tree	Horses		2,720	2,720
	Mussentuchit	Horses		11,420	11,420
SUBTOTAL				14,140	14,140

(Continued)

TABLE 29 (Concluded)

Herd Management Area and Unit	Grazing Allotment	Kind of Animal	BLM Acres		
			Yearlong	Critical	Total
Canyon Pond	Dry Wash	Horses	160	90	250
	Lone Tree	Horses	1,460	12,360	13,820
	South Ferron	Horses	60		60
	South Sid & Charley	Horses	470	950	1,420
SUBTOTAL			2,150	13,400	15,550
MUDDY CREEK TOTAL			72,150	64,960	137,110
Sinbad (UT-652) McKay Flat	Big Pond	Horses	8,190		8,190
	Georges Draw	Horses	11,690		11,690
	Head of Sinbad	Horses	1,430		1,430
	Hondo	Horses	300	860	1,160
	McKay Flat	Horses	1,100	43,660	44,760
	Red Canyon	Horses	15,760	7,910	23,670
	Taylor Flat	Horses	36,230		36,230
	Temple Mountain	Horses	10,150	3,770	13,920
SUBTOTAL			84,850	56,200	141,050
Black Dragon	Big Pond	Burros	10		10
	Black Dragon	Burros	6,770	17,920	24,690
SUBTOTAL			6,780	17,920	24,700
Mexican Mountain	Black Dragon	Burros	7,380	12,340	19,720
	Mexican Bend	Burros	11,330	880	12,210
	North Sinbad	Burros	15,210	4,710	19,920
SUBTOTAL			33,920	17,930	51,850
SINBAD TOTAL			125,550	92,050	217,600
GRAND TOTAL			297,590	178,090	475,680

[a] Critical section A.

[b] Critical section B.

[c] Critical section C.

mechanized farming. Finken [1977] estimated that there were between 200 and 500 unclaimed horses and hundreds of burros on San Rafael Desert and San Rafael Swell by 1939. These animals were declared a nuisance, and many were shot [Finken, 1977].

The first inventory after passage of the Wild and Free-Roaming Horses and Burros Act was taken in 1973. Wild horses in SRRA are estimated to have increased 185 percent and wild burros 100 percent (an average annual increase of 15 percent in horses and 8 percent in burros). Today (1987) an estimated 180 horses and burros are found on the San Rafael Desert and Swell (table 30).

The animals range over a fairly large area (table 29). Food and water dictate the animals' movements; the more limited the food or water, the farther the animal travels [BLM, 1983c].

There are differences of opinion regarding the number of wild horses required to maintain a viable reproductive herd with sufficient diversity to prevent inbreeding problems. The nature of wild horses to congregate in small bands (three to eight head) with one dominant stud provides opportunity for inbreeding, since the dominant stud mates with closely related mares. Inbreeding intensifies both good and bad qualities. It is doubtful that 20 or fewer wild horses in a herd unit can provide the genetic diversity needed, unless new studs are added on a regular basis. If the needed diversity is not provided, the normal inbreeding traits of large heads, weak legs and skeletal structure, high birth mortality, and short life expectancy would be expected to occur. The end product is wild horses that are difficult to place by adoption [BLM, 1986a].

Wild horses are found in the following SRRA grazing allotments: Dry Wash, Globe-Link, Hondo, Lone Tree, McKay Flat, Moonshine, Mussentuchit, Red Canyon, South Sid and Charley, Sweetwater, and Temple Mountain. Burros are found in the Black Dragon, Mexican Bend, and North Sinbad Allotments [BLM, 1976a].

Allocations

Grazing allotments within SRRA were adjudicated through the 1950s and 1960s. Wild horses and burros were not considered in the adjudication, and no forage was allotted to them.

Resource Condition and Potential

Some reports of harrassment of wild horses and burros have been received.

Increases in herd populations threaten other habitat areas.

The wild horses and burros do not have seasonal ranges in the planning area since most of the range is year long. Their movement is primarily dictated by water location, forage availability, and snow depth. Whenever conditions are right, the horses may choose to be in any part of their range. Certain horses, however, seem to prefer certain areas (map 42). Table 31 lists grazing allotments inhabited by wild horses and the estimated number of horses in each allotment.

Critical habitat for horses and burros should provide forage, water, space, and protection. All of these features except water are available throughout SRRA. Forage is generally available except in certain areas where competition with domestic livestock has reduced the forage and also during winter when snow is deep enough to cover all forage.

WILDLIFE

Location and Extent of Resource

All population estimates presented in this document were derived through cooperative efforts of BLM and Utah Division of Wildlife Resources (UDWR) personnel, as were delineations of summer, winter, and yearlong habitat areas. The figures presented as prior stable populations are also UDWR's long-term herd management goals.

Desert Bighorn Sheep Habitat

Approximately 225 desert bighorn sheep inhabit about 500,930 acres year-round in the San Rafael Reef and San Rafael Swell portions of the planning area (map 71). The prior stable populations of this species is 2,920 (UDWR). Surface ownership and management responsibilities for desert bighorn sheep habitat are shown in table 32. Crucial desert bighorn sheep habitat consists of rutting and

TABLE 30

Wild Horse and Burro Counts

Herd Management Area and Unit	Kind	1973	1976	1977	1978	1981	1982	1983	1984	1985	1987	1988	% Change 1973 to Last Count	Estimated Herd Size
Robbers Roost (UT-653)														
Flat Top	H	5	7	6	8(1)	NC	12(1)	20(3)	12	NC	NC	NC	+140	10
Muddy Creek (UT-651)														
Globe Link	H	17	44	10	27(7)	35	28(1)	46(8)	39	NC	NC	NC	+129	50
Canyon Pond	H	6	0	2	5(1)	NC	5(1)	4	NC	NC	NC	9(1)	-33	9
Sinbad (UT-652)														
Mckay Flat	H	9	14	0	5(1)	10(1)	5(1)	24(4)	NC	NC	NC	NC	+167	45
Black Dragon	B	17	0	0	7(1)	NC	7	6(1)	34	26	50	NC	+194	45
Mexican Mountain	B	8	0	0	0	NC	0	17	0	NC	NC	NC	+112	25
TOTAL	Horses	37	65	18	45	45	50	94	51	NC	NC	9	+175	114
	Burros	25	0	0	7	0	7	23	34	26	50	0	+100	70

NOTE: NC = not counted in this area, this year. Also, wild horses and burros were not counted in 1974, 1975, 1979, 1980 or 1986.

Parentheses indicate the number of colts in the total count. For example, 27 (7) indicates that 7 of the 27 horses were colts.

No information is available concerning the distribution of the animals in 1971.

Source: BLM inventory.

TABLE 31

Grazing Allotment Use by Wild Horses and Burros

	Herd Unit			Animals	
Herd Management Area	Name	Number	Grazing Allotment	Number	Kind
Robbers Roost (UT-653)	Flat Top	1	Horseshoe North	Incidental	H
			Iron Wash	Incidental	H
			Jeffery Well	Incidental	H
			Moonshine	Incidental	H
			Pasture Canyon	Incidental	H
			Sweetwater	10	H
Muddy Creek (UT-651)	Globe-Link	3	Globe-Link	10	H
			Last Cnance	Incidental	H
			Lone Tree	30	H
			Mussentuchit	10	H
			South Sid & Charley	Incidental	H
	Canyon Pond	4	Dry Wash	Incidental	H
			Lone Tree	9	H
			South Ferron	Incidental	H
			South Sid & Charley	Incidental	H
Sinbad (UT-652)	McKay Flat	2	Big Pond	Incidental	H
			Georges Draw	Incidental	H
			Head of Sinbad	Incidental	H
			Hondo	Incidental	H
			McKay Flat	30	H
			Red Canyon	10	H
			Taylor Flat	Incidental	H
			Temple Mountain	5	H
	Black Dragon	6	Black Dragon	45	B
			Big Pond	Incidental	B
	Mexican Mountain	7	Black Dragon	25	B
			Mexican Bend	Incidental	B
			North Sinbad	Incidental	B

Source: BLM estimates.

lambing areas (approximately 109,600 acres, (map 71). Desert bighorn sheep lambing grounds require protection between April 1 and June 1.

TABLE 32

Desert Bighorn Sheep Habitat Ownership and Management

Management	Planning Area Acreage	Percent
BLM	448,170	89
Private	0	0
State	52,760	11
TOTAL	500,930	100

BLM records.

A large part of the planning area's desert bighorn sheep habitat cannot be used because water is unavailable during all or part of the year. Animals tend to congregate around water sources in summer. Where limited water sources are shared, desert bighorn sheep are often excluded because of their intolerance for the other species present. Water developments are needed to improve habitat for desert bighorn sheep.

Under present management, desert bighorn sheep population is expected to increase, and the extent of habitat is expected to remain sufficient. Current competition is not generally a problem.

Diseases carried by domestic livestock may adversely affect desert bighorn sheep populations.

Several transplants of desert bighorn sheep onto the planning area have been undertaken since 1978. Desert bighorn sheep were removed from Canyonlands NP and public lands west of Moab, Utah and placed in San Rafael Reef and San Rafael Swell. UDWR has used radio telemetry to monitor them.

A study to inventory and analyze desert bighorn sheep crucial habitat elements has been proposed. There are no habitat management plans (HMPs) covering desert bighorn sheep in the planning area; however, if the proposed study is completed, data and analyses generated from it would be incorporated into an HMP for the area.

Desert bighorn sheep within the planning area were hunted in the 1988 season. Two permits were issued for this hunt.

Antelope Habitat

Antelope within the planning area are divided into herd units 9 (San Rafael, in the southeast part of the planning area) and 11 (Icelander, in the north). The 500 antelope in San Rafael herd unit occupy approximately 589,000 habitat acres. Of the San Rafael herd unit's 517,900 public land acres, the Henry Mountain Resource Area, Richfield District, manages 51,000 acres in the grazing area (9 percent), and the remaining 512,800 acres are in the planning area.

The Icelander herd unit contains about 104 antelope and occupies approximately 42,800 acres of public land in the planning area. All antelope habitat in the planning area is used yearlong (map 72). Surface ownership and management responsibilities for antelope habitat are shown in table 33.

Fawning areas have not been mapped for the planning area; acreage figures are therefore unknown. Antelope fawning generally occurs between May 1 and June 20, with an additional 3-week period following fawning (until July 15) when fawns are extremely vulnerable to predation.

The habitat areas provide the low, rolling, wide-open, expansive terrain that antelope prefer, but limited water affects distribution. Antelope need to be within 3 or 4 miles of water to produce and maintain adequate herd densities. Additional waters are needed to ensure an adequate water supply within this desired distance.

TABLE 33

Antelope Habitat Ownership and Management

Herd Unit	Management	Planning Area Acreage	Entire Herd Unit Acreage	Percent
9	BLM	434,900	517,900	88
San Rafael Herd	Private	5,600	5,100	1
	State	55,300	66,000	11
TOTAL		495,800	589,000	100
11	BLM	72,440	664,960	84
Icelander Herd	Private	2,700	85,760	11
	State	15,490	42,880	5
TOTAL		90,630	587,600	100

Source: Jense, et al., 1986.

Cattle grazing occurs mainly during winter and early spring, causing competition between cattle and antelope for browse species. Adequate amounts of grass species provide good early spring forage for the Icelander herd, and forb species present provide antelope with a good source of summer forage.

The antelope population is expected to increase because the available habitat is sufficient to support additional animals. Predation, lack of water, and competition for forage will likely continue to influence the rate of herd size increase.

The San Rafael herd unit was closed to hunting from 1979 through 1982 and opened again in 1983 with the issuance of five buck permits. Now that the herd has been increased with transplants, it will probably not be closed to hunting again in the foreseeable future. The Icelander herd unit has been hunted from 1975 to the present; because the herd is growing, the number of permits allowed has continued to increase.

Mule Deer Habitat

The planning area contains part of eight mule deer herd units: 29 (San Rafael), 33 (Gordon Creek), 34 (Huntington), 35 (Joes Valley), 36 (Muddy-Ferron), 43 (Salina-Boobe Hole), 45 (Last Chance), and 46 (Thousand Lake Mountain). A small population of nonmigratory mule deer inhabit portions of the planning area year-round, and concentrated winter use occurs in the western part of the planning area (map 73).

The eight herd units occupy a total of about 1,818,900 acres, of which 155,100 acres are winter range, 6,640 acres are summer range, and 1,657,100 acres are yearlong range. Of this total, approximately 85,900 acres of winter range which contains 35,510 acres of crucial winter range, 2,400 acres of summer range, and 1,246,100 acres of yearlong range fall on BLM-administered lands. See table 34 for range area and ownership and management responsibility.

The planning area provides winter habitat for approximately 5,100 mule deer, summer habitat for approximately 100 mule deer, and yearlong habitat for approximately 900 mule deer.

Crucial mule deer habitat consists of fawning and wintering areas where high-density use occurs, usually due to limited area availability. Fawning areas within the planning area are not known and thus have not been mapped. Seasonal protection from disturbance is usually needed between November 15 and May 1; these dates may vary in any given year because of weather conditions.

Water is a limiting habitat feature on the yearlong mule deer range in the planning area. Much of the winter range is without reliable water sources. Mule deer water along the perennial and intermittent watercourses, causing problems for private land owners.

The planning area provides ample cover for deer, but foraging areas in many of the herd units are well under the optimum ratio of forage to cover. The vegetation is of poor quality, and the species mix

TABLE 34

Mule Deer Habitat Ownership and Management

Deer Herd Unit	Managing Agency	Acres Winter Range (percent)	
		Planning Area Portion	Entire Herd Unit
29	BLM	0	1,446,300 (90%)
	State	0	80,400 (5%)
	Private	0	80,400 (5%)
TOTALS		0	1,607,100
33	BLM	200	52,700 (60%)
	USFS	0	1,200 (1%)
	Private	300	10,800 (12%)
	State	0	13,200 (15%)
	UDWR	0	10,000 (12%)
TOTALS		500	87,900
34	BLM	16,800	15,900 (73%)
	USFS	0	500 (2%)
	Private	600	2,300 (11%)
	State	2,900	1,900 (9%)
	UDWR	0	1,000 (5%)
TOTALS		20,300	21,600
35	BLM	18,200	18,300 (21%)
	USFS	0	60,300 (70%)
	Private	2,600	4,700 (5%)
	State	2,400	3,100 (4%)
TOTALS		23,200	86,400

(Continued)

TABLE 34 (Concluded)

Deer Herd Unit	Managing Agency	Acres Winter Range (percent)	
		Planning Area Portion	Entire Herd Unit
36	BLM	8,200	14,200 (16%)
	USFS	0	70,100 (80%)
	Private	600	1,500 (2%)
	State	1,500	2,100 (2%)
TOTALS		10,300	87,900
45	BLM	38,400	51,900 (48%)
	USFS	0	41,400 (39%)
	Private	7,100	8,100 (8%)
	State	3,200	5,900 (5%)
TOTALS		48,700	107,300
46	BLM	4,120	6,600 (7%)
	USFS	0	59,900 (66%)
	Private	400	19,000 (21%)
	State	200	3,500 (4%)
	NPS	900	1,400 (2%)
TOTALS		5,620	90,400

Source: Jense, et al., 1986.

does not contain enough of the nutritious species that mule deer prefer. Mule deer compete with elk and livestock for forage, particularly on the winter range.

Mule deer have not been transplanted to or from the planning area.

HMPs have not been developed for deer in the planning area, but one water catchment was placed for mule deer and elk in Huntington Canyon in 1983 to allow use of forage areas away from distant water sources during fall and spring and to improve yearlong habitat.

The Wildlife Allotment is also used by mule deer.

Elk Habitat

The planning area contains winter habitat for herd units 12 (Manti) and 14 (Fish Lake). Approximately 6 elk in the Manti herd winter on 84,000 public land acres in the planning area, and about 550 elk in Fish Lake herd winter on 69,750 acres, while a portion of the Manti elk herd winter on 21,300 acres in the planning area; a part of the Fish Lake elk herd winter on 45,520 acres (in the planning area). Surface ownership and management responsibility is shown in table 35.

Crucial elk range consists of calving areas (none are found in the planning area) and wintering areas. Approximately 18,200 acres of crucial elk winter habitat are found in the planning area (map 74). These crucial wintering areas require protection from disturbance between November 15 and May 1 each year, depending upon snow conditions.

During the fall and early spring and in years with light snowfall, much of the elk winter range is without reliable water sources. Elk water along the perennial and intermittent watercourses, where they sometimes cause problems for private land owners.

Elk forage areas make up less than the recommended 60 percent of their habitat and are of poor vegetative composition. Few native forbs are present; elk use privately owned agricultural areas, especially alfalfa crops, in the spring. Ample cover exists, although of less than desirable height or canopy closure.

TABLE 35

Elk Habitat Ownership and Management

Herd Unit	Management	Planning Area Acreage	Entire Herd Unit Acreage	Percent
12	BLM	84,000	181,760	14
	USFS	155,780	748,800	56
	Private	60,300	351,360	26
	State	14,800	54,400	4
TOTAL		314,880	1,336,320	100
14	BLM	69,750	80,720	14
	USFS	59,100	438,400	74
	Private	43,000	57,600	10
	State	10,100	10,880	2
TOTAL		181,950	587,600	100

Source: Jense, et al., 1986.

Because of strong similarities in their diets, cattle and elk compete for forage. Several grazing allotments in the planning area provide crucial winter habitat for elk and are also used by livestock in winter and spring. Elk compete with domestic sheep for forage on the Rock Canyon and Ferron Mills allotments. Elk are intolerant of other species and tend to stay at least 0.5 mile from the sheep.

Elk have not been transplanted into the planning area, but onto the adjacent NFs, Fish Lake (10 elk in 1912 and 37 in 1913) and Manti-LaSal (24 elk in 1915). The resulting population increases have caused herds to expand onto public lands. At the present rate of increase the elk population is expected to increase past the habitat carrying capacity within the next 12 years (before 2000).

HMPs have not been developed for elk within the planning area, but a water catchment was placed in Huntington Canyon in 1983 to allow elk and deer to use forage areas away from distant water sources during fall and spring. The Wildlife Allotment (630 acres) has been designated for use solely by wildlife, including elk. Approximately 60 to 70 elk often winter in this allotment.

Riparian and Aquatic Habitat

Streams, watercourses, and rivers in the planning area total about 357 miles. Only 270 miles of these contain riparian habitat (14,770 acres). The remainder has steep cliffs or bluffs meeting the stream or course edge, precluding any riparian vegetation. Not all riparian areas support aquatic habitats, but permanent pools are scattered along all drainages listed, and perennial streams also provide permanent aquatic habitats. Riparian habitat areas are shown on map 75, aquatic habitat areas on map 76.

Millsite and Huntington North Reservoirs and Huntington, Cottonwood, Salina, and Ferron Creeks are important trout fisheries.

Canyon Pond, a livestock-watering reservoir, has a population of sunfish; catfish can be caught on the Green and San Rafael Rivers.

Riparian areas attract many different types of use. Because scenic values are usually high, recreationists concentrate their use in these areas. Roads are often located in riparian areas in canyon and drainage bottoms.

General information is available from the ecological inventory completed in fiscal year 1985; however, the ecological status of riparian habitat in the planning area has not been determined. In most riparian areas, evidence of soil erosion, downcutting, headcutting, and vegetation removal can be seen.

Inventories will be initiated to quantify the condition of this habitat, and measures taken to stabilize or improve the habitat.

An HMP has not been developed for any riparian, aquatic, or fishery habitat within the planning area.

Threatened and Endangered Species

Three endangered fish and one sensitive fish occur in the planning area. The endangered humpback chub is found in the Green River, but since the Green and San Rafael Rivers do not contain the deep canyon habitats generally favored by humpback chubs, it is believed that those identified in the planning area were young fish moving to preferred habitats.

The endangered bonytail chub may be present in the planning area; it has not been reported in recent years.

Endangered Colorado squawfish are found along the entire length of the Green River within the planning area and are believed to spawn in two areas: a few miles south of the town of Green River, Utah, downstream to around river mile 93; and from the BLM/Canyonlands NP boundary upstream 19 miles to Bowknot Bend.

The razorback sucker, a sensitive species, also occurs along the entire Green River portion of the planning area and is suspected to spawn from a point 8 river miles south of the confluence of the San Rafael and Green Rivers upstream for approximately 20 miles.

The planning area provides winter habitat for bald eagles; they arrive during October and November and depart by March or April. Most bald eagle observations in the planning area are along the Green River. The cottonwood trees in this riparian habitat along this river provides crucial roosts for bald eagles.

One peregrine falcon eyrie has been confirmed within the planning area. The birds are sensitive to human presence and extremely vulnerable to theft.

The ferruginous hawk, a candidate species, is an active nester in the planning area. A few ferruginous hawks nest on the ground or in trees on hilly, open terrain outside San Rafael Desert; these birds winter outside the planning area.

The Swainson's hawk may also be found in the planning area, as it migrates between nesting areas in the north and wintering areas in South America.

The black-footed ferret historically occurred within the planning area, although it is not known to exist here presently. Prairie dogs, the ferret's primary food source, occupy 9,240 acres.

Threatened, endangered, and sensitive animal species known to occur in the planning area, along with those that may occur, are listed in table 36.

Raptor Habitat

Raptor habitat includes nest sites, foraging areas, and roosting or resting sites (trees, cliffs, power poles, etc.). Golden eagles, red-tailed hawks, and prairie falcons nest in cliffs or trees in San Rafael Reef, San Rafael Swell and west of Highway U-10. Rough-legged hawks winter in the planning area, with the highest concentrations found in San Rafael Desert and along U-10.

The planning area also provides habitat for two endangered and two candidate raptor species.

Crucial habitat areas for raptors include nest sites (territories), foraging areas, and hunting perches in the San Rafael Desert. Nesting raptors generally require protection from disturbance within a half-mile radius around their nests. Because ferruginous hawks build their nests on the ground or in trees only 10 feet high, they are sensitive to activities on the ground and may require a buffer radius of 1 mile.

Nest sites are in ample supply. Raptors are generally limited by the food source in the planning area. Riparian habitat supports the greatest diversity and numbers of non-game species, thus providing the greatest food supply for raptors. Human activities may cause abandonment of nesting territories.

In the 1980s, BLM and Mountain Bell installed 19 telephone pole perches for raptors in the San Rafael desert. The San Rafael Desert HMP recommends installation of additional perches (telephone poles) throughout the desert.

Allocations

Use of wildlife resources is generally either consumptive (hunting, fishing, and trapping) or nonconsumptive (observation and photography). Most nonconsumptive use is incidental to hiking, horseback riding, skiing, backpacking, or sightseeing, all of which take place throughout the year.

BLM is responsible for managing the habitat for game species, while UDWR manages the hunting and fishing seasons and enforces game laws. BLM recognizes UDWR's big game herd unit boundaries and allocates forage for big game, but does not allocate use of wildlife resources.

BLM identifies and protects crucial wildlife habitat areas while managing other resource uses. Types of management restrictions will be defined through the RMP.

HUMAN USES

GRAZING

Location and Extent of Resource

The San Rafael Grazing Area includes SRRA, FPU, and the Richfield District grazing allotments for which Moab District is responsible under a May 1980 interdistrict agreement. Grazing use in the San Rafael Grazing Area is based on historical use and depends on the availability of forage and water. All of the grazing area acreage is open for livestock grazing except the Wildlife Allotment, which is reserved for wildlife, and Buckhorn Draw, which is closed to grazing because of its aesthetic and recreation values.

Allocations

BLM administers grazing on units of land called grazing allotments. Grazing allotments are shown on map 43, and also on pocket map B. Topography and fences define allotment boundaries. An allotment is assigned for use by a single permittee or a group (sometimes organized as a grazing association).

TABLE 36

Status of Threatened, Endangered, or Sensitive Animals

Common Name	Status	Scientific Name	Known to Occur in Planning Area	Habitat Use
Bald eagle	Endangered	Haliaeetus leucocephalus	Yes	Winter
Peregrine falcon	Endangered	Falco peregrinus var. anatum	Yes	Nesting[a]
Ferruginous hawk	Candidate	Buteo regalis	Yes	Nesting[a]
Swainson's hawk	Candidate	Buteo swainsoni	Yes	Transient
Western snowy plover	Candidate	Charadrius alexandrinus nivosus	No	Nesting[a]
Mountain plover	Candidate	Charadrius montanus	No	Nesting[a]
Long-billed curlew	Candidate	Numenius americanus	Yes	Nesting[a]
White-faced ibis	Candidate	Plegadis chihi	No	Nesting[a]
Southern spotted owl	Candidate	Strix occidentalis lucida	No	Nesting[a]
Black-footed ferret	Endangered	Mustela nigripes	No	Yearlong
Spotted bat	Sensitive	Euderma maculata	No	Unknown
Southwestern river otter	Sensitive	Lutra canadensis sonorae	No	Yearlong
Humpback chub	Endangered	Gila cypha	Yes	Transient
Bonytail chub	Endangered	Gila elegans	No	Unknown
Colorado squawfish	Endangered	Ptychocheilus lucius	Yes	Yearlong[b]
Razorback sucker	Sensitive	Xyrauchen texanus	Yes	Summer

[a] Nesting habitat includes breeding areas and areas where young are raised.

[b] Yearlong habitat for the Colorado squawfish includes spawning areas.

Source: Federal Register Vol. 50, No. 181, September 18, 1985, pp. 37958 to 37967 and Vol. 51, No. 86, May 5, 1986, pp. 16526 to 16530.

A permittee may not graze livestock on BLM lands without authorization. This authorization is an annual or 10-year-term grazing permit, renewable to the same permittee as long as he abides by the grazing regulations (43 CFR 4100).

Base property is private land used as a base for the grazing operation. Grazing privileges are attached to base property and remain with it through change of land owners unless transferred. The base property must be capable of sustaining the livestock for 2 months out of the year. Permittees who use the San Rafael grazing area have base property in either Emery, Wayne, or Sevier County. A permittee continues to use the same allotment year after year unless the grazing privileges are transferred to another permittee or unless he loses them because of serious infractions of the grazing regulations or leases or sells the base property.

The permittee must own the rights to the base waters in order to run livestock on the Horseshoe North, Horseshoe South, Iron Wash, and Sweetwater Allotments. The four allotments have a total of 6,472 water-based animal unit months (AUMs) of livestock forage. Key forage species, by grazing allotment, are listed in appendix O.

Allotment boundaries can be changed administratively; such changes are sometimes made to combine allotments or parts of allotments when grazing privileges are transferred, or to correspond to natural barriers.

SRRA administers grazing on 95 allotments held by 142 permittees; the Sevier River Resource Area administers grazing on 6 allotments held by 5 permittees in FPU.

Allotments are grouped into three categories according to their potential to respond to management: (M) maintain; (I) improve; or (C) custodial. Table 37 summarizes allotment categorization. Appendix G explains the categorization criteria and lists the current management category for each allotment.

All of the allotments were adjudicated in the 1960s, based on range surveys conducted at that time. Some reductions in grazing use were required to be taken over a 3-year period, with one-third of the cuts to be taken each year. Most of the third-year reductions were never imposed.

TABLE 37

Allotment Categorization Summary

Admin Unit	Current Category	No. of Allotments	Acreage	Percent of Allotments
SRRA[a]	M	33	423,750	30
	I	27	941,940	66
	C	35	51,890	4
SUBTOTAL		95	1,427,580	100
FUP[b]	I	6	190,240	100

[a] Includes all the allotments where SRRA administers the grazing (Emery, Wayne and part of Sevier Counties), public lands only. Unallotted lands, Buckhorn Draw and the Wildlife Allotment were not assigned to a management category.

[b] Includes only the allotments where Sevier River Resource Area administers the grazing.

Sources: SRRA allotment monitoring plan; Sevier River Resource Area rangeland program summary update.

Since adjudication, some allotment boundaries have been changed, two areas have been closed to livestock grazing, and some areas are unallotted. The Wildlife Allotment has been allotted to wildlife, principally deer and elk. The area known as Buckhorn Draw was closed to grazing in 1963 for aesthetic and recreation values. The closure allows for trailing of livestock through the draw, but does not permit stopping there overnight. There are approximately 1,730 acres of unallotted lands within SRRA and 920 in FPU.

Current grazing use and season are shown for each allotment in appendix I. Of the 101 total allotments, 75 have use between April 16 and June 15 each year. The Iron Wash Allotment is used from March 1 to December 31. The Sweetwater Allotment has year-round use. The grazing period for the remaining allotments is between 1 and 8 months, during various times of the year. Currently (1988) the 5-year average licensed use is 56,871 AUMs, and active preference is 88,252 AUMs.

One allotment is stocked with cattle and sheep, six with sheep, and one with horses. The remaining 93 allotments are stocked with cattle, and three of these also have licensed use for horses.

Resource Condition and Potential

Vegetation production in the grazing area is believed marginally sufficient to meet the forage demand for active preference, but livestock cannot use an estimated 15 to 20 percent of the forage because it is inaccessible or because adequate water is not available. This situation could be remedied with vegetation treatments (chainings and seedings), intensive grazing management systems, or water developments. However, vegetation treatments are considered risky due to shallow soils and limited precipitation (5 to 9 inches) in the resource area.

Rangeland monitoring studies have been established throughout the grazing area since 1965, and new studies are continually being established (appendix H).

Cattle and sheep were first brought into the Castle Valley area in 1875 and moved east onto San Rafael Swell in the early 1880s [Finken, 1977]. Five permittees currently graze sheep on public lands, but historical sheep use in the area was higher than at present.

In this area, historical use on public lands has been primarily for winter and spring grazing, but also for yearlong grazing where livestock water was available. USFS lands adjacent to the grazing area provide summer and fall (June to October) grazing for many of the livestock that winter on public lands.

During the late 1960s, BLM endeavored to prepare an allotment management plan (AMP) for every grazing allotment. For allotments within the San Rafael grazing area, 23 AMPs were written. Of these, 6 were implemented in whole or in part (map 43).

Water facilities exist throughout the planning area; most were constructed to benefit livestock and facilitate improved grazing distribution.

Vegetation is a basic component of the grazing resource (see Vegetation, this chapter). Livestock use four main vegetation zones: pinyon-juniper, saltbush, grassland, and blackbrush. Other areas of concern are riparian areas, poisonous and noxious plants, and ecologically unique areas. Water is another basic component.

Pinyon-Juniper

The pinyon-juniper zone produces little forage for livestock because the tree roots deplete the soil of available moisture and nutrients; as a result, understory forage species are often scarce or altogether absent.

Sagebrush

The sagebrush zone consists mainly of browse species with a few grasses present. Most areas are accessible to livestock, but use is often limited or precluded by a lack of water. Cattle use these areas mainly in the fall and winter; some areas are used in the spring.

A number of acres were chained and seeded in the late 1960s and early 1970s to support more desirable forage species (map 81); many of these treatments were ineffective. Some of the treated areas have reverted to native vegetation.

Saltbush

The saltbush zone generally produces a mixture of browse and grass species for livestock. Most of these areas are accessible to livestock, but use is often limited or precluded by a lack of water. Reservoirs, the main sources of water, are often dry during the winter and spring use periods.

Blackbrush

Blackbrush areas that support stands of forage species are useful for livestock grazing in fall, winter, and spring. Cattle generally do not use blackbrush itself if other forage is available.

Grassland

The grassland zone produces a mixture of grasses and shrubs. Most of these areas are used by cattle during the fall, winter, and spring or by sheep in the winter and spring.

Riparian Areas

Riparian areas are generally accessible to livestock and are heavily utilized because of their relatively lush vegetation, available water, and shade.

Poisonous and Noxious Plants

Poisonous and noxious plants are present throughout the grazing area, but generally do not occur in concentrations that would pose a significant threat to livestock. Halogeton and locoweed poisonings are occasionally reported. Broom snakeweed, common throughout the grazing area, is also toxic.

Ecologically Unique Areas

Some of the isolated mesa tops scattered throughout the area are ecologically unique and could be considered relict areas, since inaccessibility limits or prevents livestock and wildlife grazing.

In the 1960s, Link Flats (912 acres) was identified as having ecologically unique rangeland value [McNulty and Harper, 1966] and was nominated for natural area designation. The area was never properly studied nor designated as a natural area; the original rationale for designation appears to be in error, as does the legal description published in the Federal Register; and there is a discrepancy between the actual area of Link Flats and the area described.

Link Flats was segregated from mineral entry under the general mining laws and from surface use and occupancy under the mineral leasing laws. The area did have a history of grazing use, and it was recommended that the natural area listing be discontinued. The area does not, in fact, contain unique rangeland values or rare plants, and it is not an ungrazed plant community.

Water Developments

Livestock water is generally scarce over the entire area. The numerous reservoirs are generally not dependable. Springs, wells, and pipelines are more reliable, but are difficult or infeasible to construct in many areas. Constructed rock tanks are somewhat more successful than reservoirs. Some areas have no surface water and can be used by livestock only when snow covers the area or when water is hauled in. Livestock forage near available water is heavily utilized, with little or no grazing use in areas without water.

Range Improvements

Land treatments and management facilities in the area provide additional livestock forage; make unusable areas usable by adding water and access; provide more uniform distribution of livestock; provide more intensive management, including rest periods for improved ecological status on native range; and aid in control and handling of livestock. Grazing permittees are generally responsible to maintain structural improvements such as fences, wells, and reservoirs, while BLM maintains seedings and other nonstructural improvements.

Contour furrowing projects (totaling 3,900 acres) were developed primarily to control watershed erosion, but also to provide forage for livestock. Most SRRA staff specialists agree that contour furrowing projects have not been highly successful.

Most fences throughout the planning area were constructed to control livestock movement and to establish allotment boundaries.

CULTURAL RESOURCES

Location and Extent of Resource

Cultural resources consist of (1) physical remains of past human activities, occupations, and endeavors, (2) areas where significant human events occurred, even though evidence of the event no longer remains, and (3) the environment immediately surrounding the actual resource. Cultural resources, including both prehistoric and historic remains, represent a part of the continuum of events from the earliest evidences of man to the near present.

A wide range of cultural resources are contained in the planning area [Hauck, 1979; Coulam, et al., 1983]. These resources range in time from a 12,000-year-old buried Clovis site to the remains of present-day uranium mines. In importance they range from world-famous rock art sites [Smith, 1980] to obscure artifact scatters with only minimal scientific value.

The location and extent of most of the resources are unknown. It is estimated that about 70,000 archaeological sites exist in the planning area, of which about 1,500 (2 percent) are recorded. Two sites, Swasey Cabin and the Buckhorn Pictographs, are fenced and used as recreation sites.

Allocations

Cultural resources can be nominated to the National Register of Historic Places (for which NPS has designation authority), nominated to the National Historic Landmark System, or designated as areas of critical environmental concern (ACECs).

Through BLM's planning process, management objectives are established for all cultural resources known and projected to occur in the planning area. Objectives are determined for defined classes of similar cultural resources or for individual cultural sites, as appropriate.

Cultural resources managed for their information potential are capable of contributing useful scientific, historic, or management information. This information potential is to be protected to the extent needed, by physical or administrative means, until it has been realized through appropriate study.

Cultural resources that possess identified socio-cultural, educational, recreational, or other public values are to be managed in a manner that gives adequate consideration to these values (management for public values).

Cultural resources that have overriding scientific or historic importance are to be managed by the means necessary to maintain them in their present condition and to protect them from potentially conflicting land or resource uses (management for conservation).

Resource Condition and Potential

Mineral exploration and development, recreation use, livestock grazing, and vandalism are damaging some cultural resources; impacts are noted on all sites presently being recorded.

The potential of cultural resources is limited only by the ability to preserve them intact for study. The planning area is considered to be the center of the Fremont culture [Jennings, 1978], and its abundant cultural resources show human presence in the area over the past 12,000 years. The information that could be gained from cultural resources in the planning area is not available elsewhere.

Current management emphasizes identification and mitigation of direct effects on cultural resources from permitted and licensed projects on the public lands. Some cultural resources in the planning area are well preserved, while others have been totally destroyed. Many sites have been damaged, intentionally or unintentionally, through human activity over the past 100 years. It is now difficult to find undisturbed cultural resource sites within the planning area.

Cultural resource values are being lost in those parts of the planning area where energy exploration and development, recreation use, and pot hunting take place. In the few areas where those activities do not occur, there is probably little change in the condition of cultural resources. Resource condition, however, continues to deteriorate because of the indirect effects of permitted activities and because the direct effects of such unlicensed activities as dispersed recreation are not controlled. Cultural sites are used as campsites, trampled, driven over with vehicles, dismantled for fuelwood, enhanced for better photographs, or otherwise disturbed.

Although cultural resource laws emphasize preserving the resource for the enjoyment of the American people and future generations, no sites in the planning area have been designated and interpreted for public use.

Most of the currently available information about cultural resources in the planning area has come from mitigation of impacts from surface disturbance. Some excavations have been done by academic institutions pursuing research. An Archaeological Resources Protection Act (ARPA) permit is required and must include evidence of the applicant's qualifications, the purpose of the proposed work, and the methods to be used. Because funding for academic research is extremely limited, little excavation work is currently being done (1988). However, opportunities for archaeological research in the planning area are believed unlimited.

The resource area manager's responsibility for cultural resource management includes making recommendations and stipulations concerning (1) protective designations of cultural resources; (2) the effect an undertaking may have on eligible cultural resources; and (3) the issuance or denial of cultural permits.

RECREATION

Location and Extent of Resource

Recreation use occurs throughout the entire planning area, much of it concentrated in the eastern part of San Rafael Swell, although similar recreation opportunities are available elsewhere in the planning area. Developed recreation sites in use are San Rafael Campground and Swasey Cabin. Existing and potential recreation sites are shown on map 57.

The SRRA recreation management program is geared primarily toward management of San Rafael Swell and Labyrinth Canyon Special Recreation Management Areas (SRMAs) (map 55). The remainder of SRRA has been designated as the San Rafael Extensive Recreation Management Area (RMA). The entire FPU is referred to as the Forest Planning Unit Extensive RMA. Because most recreation use in the extensive RMAs is dispersed, there is less need for resource protection and user conflict resolution than within SRMAs.

Because of its unique recreation opportunities, SRRA attracts recreationists from throughout the United States and abroad, although about 70 percent of the visitors reside in the region. Opportunities are ample for backcountry uses such as hiking, nature study, photography, camping, and observing scenery, archaeology, historic sites, geology, and other natural features. Water-based recreation opportunities include swimming, river running, canoeing, and fishing. Other recreation uses in the semiprimitive motorized (SPM) and roaded natural (RN) ROS classes include auto touring, picnicking, rock collecting, and ORV use. Opportunities are limited for winter activities. Wildlife are present in sufficient numbers to allow considerable opportunities for hunting big and small game.

Allocations

Recreation use is allocated through designation of SRMAs and ORV use areas, as well as through regulation of special recreation use permits.

The resource area manager can designate an SRMA administratively when special management is needed to protect recreation values, reduce resource damage, solve health and safety problems, mitigate surface use conflicts, or provide the public with scarce recreation opportunities that would not otherwise be available (43 CFR 8372.0-5). Recreation use in an SRMA may or may not require a special recreation permit (43 CFR 8372.1).

The BLM is required to allocate ORV use by designating all the lands within the resource area as open, closed, or limited for ORV use (43 CFR 8342). This is done through the RMP process by identifying conflicts among various surface uses and determining whether ORV designations are an appropriate means of conflict resolution. The designations do not distinguish between recreational and nonrecreational ORV use. No ORV designations have been made for lands within the planning area.

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BLM studies rivers to determine their eligibility as wild, scenic, or recreational under the Wild and Scenic Rivers Act. Studies are made in accordance with the final USDI-USDA (U.S. Department of Agriculture) Guidelines for Eligibility Classification and Management of River Areas (September 7, 1982). Three river segments in SRRA are under study: Green River, San Rafael River, and part of Muddy Creek. No segments in FPU are under study. The RMP/EIS provides background data for the suitability studies (appendix J). Only Congress can designate a river or a segment of a river to the National Wild and Scenic Rivers System.

Permits are required for competitive and commercial recreation activities. Noncommercial recreation activities are not currently allocated (1988).

Resource Condition and Potential

Recreation opportunities are identified through the recreation opportunity spectrum (ROS) system. Through ROS, management can characterize various types of recreation settings and opportunities and the capability of the resource to provide different types of experiences. ROS classes are established as the result of an inventory and used as an analysis tool in the RMP process. All possible combinations of recreation experience, setting, and activity opportunities can be arranged along a continuum. ROS is divided into six classes: primitive (P); semiprimitive nonmotorized (SPNM); semiprimitive motorized (SPM); roaded natural (RN); rural (R); and modern urban (U). Each class is defined in terms of a combination of activity, setting, and experience opportunities (appendix K).

Table 38 shows the approximate acres in each ROS opportunity class in the planning area; the ROS class areas are shown on map 58.

Overall recreation use is moderate, and use patterns are sporadic. The resource base upon which recreation opportunities depend has been affected by motorized recreation, mostly in certain areas of crowding and concentrated use. Other resource uses, such as livestock grazing and mineral development, have changed the character of available recreation opportunities.

For those recreation activities taking place in the planning area, participation is expected to increase by 20 to 30 percent between 1985 and 2000 [Hof and Kaiser, 1983a]. These increases cannot be correlated with the capability of public lands to meet future demand without carrying capacity studies, but it is believed that the recreation resource has good potential for meeting recreation demand in all ROS classes.

Current management in SRRA is directed toward management of two SRMAs and dispersed recreation use in the remainder of SRRA. Current management in FPU is directed wholly toward dispersed recreation use. Current management is described separately for each of the SRMAs and the extensive RMAs.

San Rafael Swell Special Recreation Management Area

The San Rafael Swell SRMA includes 846,340 acres of public land. Thousands of visitors each year are attracted to its scenic vistas, red-rock canyons, archaeological resources, and abundant wildlife.

San Rafael/Buckhorn Canyons and Labyrinth Canyon were designated SRMAs in 1981. For the purpose of this planning effort, the boundaries of San Rafael/Buckhorn SRMA have been expanded to form a more logical unit, referred to as San Rafael Swell SRMA. Acreages are shown in table 38.

The primary activities include ORV exploration (primarily three- and four-wheel all-terrain vehicles (ATVs and motorcycles), camping, sightseeing, hiking, floatboating, backpacking, and climbing. Mountain bicycling has recently become popular.

Few visitor use statistics are available regarding the amount or distribution of recreation use in the SRMA. Visitation estimates are compiled annually in the swell for the Easter weekend. Estimates have ranged from 1,500 to 4,000 visitors during that weekend period between 1985 and 1988.

Use drops dramatically around Memorial Day when fishing activity increases in other areas, drawing people away from San Rafael Swell.

TABLE 38

Recreation Opportunity Spectrum Class Acreages

Area	Opportunity Class (approximate BLM acres)						
	Primitive	Semiprimitive Nonmotorized	Semiprimitive Motorized	Roaded Natural	Rural	Urban	Area Total
San Rafael Swell SRMA	100,070	212,210	336,110	197,950	0	0	846,340
Labyrinth Canyon SRMA	17,620	21,790	9,800	10	0	0	49,220
San Rafael Extensive RMA	30	15,190	353,560	205,220	3,480	40	577,520
FPU Extensive RMA	0	0	44,330	31,080	0	0	75,410
TOTAL	117,720	249,190	743,800	434,260	3,480	40	1,548,490

NOTE: Labyrinth Canyon SRMA contains 9,300 acres in Grand Resource Area (6,800 acres SPNM, 2,500 acres SPM.

Source: BLM records.

Major use areas are on the eastern side of the swell. In the areas surrounding the many dispersed, well established campsites, vegetation losses and dry soils contribute to excessive dust. Since 1983, motorized use has fanned out to other areas. Motorized uses tend to displace nonmotorized uses in many areas of the swell during spring and fall [SRRA files]. SRRA staff reports have documented heavy impacts to soils and vegetation from ATV and motorcycle activities on Buckhorn Flat; the Wedge; the bench areas just north of San Rafael River between the campground and Mexican Bend; the Swasey Cabin vicinity; Justensen Flats; Muddy Creek (near Tomsich Butte); the North Salt Wash area; the eastern flanks and southern end of San Rafael Reef; and areas north and west of Goblin Valley.

Recreation use in San Rafael Swell SRMA is most concentrated at the following popular locations, which receive different types of use, depending on the values offered.

(1) Highway travel corridors, particularly along I-70 and U-24: scenic quality, natural appearance, and rest stops and overlooks.

(2) The Head of Sinbad area: scenic quality, proximity to I-70, camping and picnicking. The Mountain Man Rendezvous in the Swasey Cabin vicinity attracts over 150 visitors annually. The Swasey Cabin historic site was stabilized in 1976 to protect cultural values. No facilities are provided at Swasey Cabin.

(3) The Justensen Flat/Copper Globe area: late spring and early fall weekend visitors, camping, and spectacular views.

(4) The Wild Horse/Temple Mountain area: ORV-oriented weekend visitors, sightseeing, rockhounding, hiking, and backpacking.

(5) The Buckhorn Draw/San Rafael Campground area: scenic quality, and a major petroglyph panel. On a high-use spring weekend, it is not unusual to count over 100 vehicles in the draw. The San Rafael Campground, the only developed campground in the SRMA, covers 10 acres and provides 15 overnight camping units, individual and group tables, water, one vault toilet, an interpretive board, and trash collection service. The area has been vandalized repeatedly, and soils and vegetation have been disturbed.

(6) The Wedge: scenic views, sightseeing, and ORV exploration. Proximity to communities in Castle Valley adds to its attractiveness as a day-use site.

(7) The Buckhorn Reservoir/Flat: social gatherings, ORV use.

(8) San Rafael River (Upper and Lower Black Boxes, Mexican Bend, and the Little Grand Canyon): floatboating, hiking, tubing, and kayaking.

(9) One special recreation use permit for commercial use of the Little Grand Canyon segment of San Rafael River was issued in 1985, two in 1986 and 1987.

(10) Sids Mountain Complex: backpacking, hiking, horsepack trips, and motorcycle use. Two special recreation use permit requests have recently (1988) been received for commercial horse trips in this area.

(11) San Rafael Reef (San Rafael River Canyon to Hidden Splendor on the Muddy River): highly visible landmark from I-70, motorcycling, hiking, and backpacking.

In 1986 a cooperative management agreement (CMA) between BLM and Pathfinders Motorcycle Club, Inc. of Price, Utah provided for joint development and management of a system of motorcycle trails within the swell in the Temple Mountain vicinity (map 57). BLM has cooperated with the Utah Division of Parks and Recreation to manage the Goblin Valley Trail Rides, an annual event.

Labyrinth Canyon Special Recreation Management Area

Labyrinth Canyon SRMA encompasses the Green River from Green River, Utah to Canyonlands NP and contains approximately 49,220 acres of public land. The eastern and western boundaries follow the rims of tributaries to the Green River. Approximately 9,300 acres of the SRMA lie within the Grand Resource Area in BLM's Moab District; the remainder lies in SRRA. The SRMA is managed jointly by SRRA and the State of Utah.

Canoeing and smooth-water floatboating opportunities, which do not require whitewater rafting experience, attract visitors from many areas. Evidence of both early river expeditions (such as D. Julien inscriptions) and prehistoric cultures can be found along the riverway and in side canyons.

Because Labyrinth Canyon has been adjudicated and determined a navigable waterway, the State of Utah has jurisdiction over the river and lands below the high-water line. BLM management is limited to the lands above that line. The estimated user days has increased from 2,016 in 1981 to 4,192 in 1987.

BLM has cooperated with the Utah Division of Parks and Recreation to install interpretive and visitor registration facilities at Green River State Park and to manage two annual events: the Canyon Country Marathon (Friendship Cruise) and the State Parks Green River Canoe Trip. Facilities are also located at Mineral Bottom, within Grand Resource Area and include an interpretive display board, visitor register, and restrooms. Mineral Bottom is a stop-over or take-out point for Labyrinth Canyon river trips and the launch site for trips through Stillwater Canyon, within Canyonlands NP.

More than eight commercial tour operators currently (1988) use the SRMA. Commercial operations generally occur below the high-water line, thus falling under state jurisdiction. Commercial recreation use of public lands in the SRMA is seasonal and limited.

San Rafael Extensive Recreation Management Area

Most lands within the extensive RMA generally do not receive substantial recreation use at this time (1988).

San Rafael Desert receives intensive periodic ORV use during Easter, Memorial Day, and Labor Day weekends. A motorcycle race, which was called San Rafael Mail Run through 1983, is generally held each September. The race, which was not held in 1984 or 1985, was renamed San Rafael Desert Race in 1986. Major management considerations include conflicts between ORV use and management of livestock grazing and wildlife habitat. Conflicts have involved harrassment of livestock, gates left open, and interference with antelope bow-hunters on opening weekend.

Huntington Canyon provides the only opportunity in SRRA for a nondesert recreation experience, with picnicking, trout fishing, hunting, and winter sports (snowmobiling, cross-country skiing, and snowshoeing) being the major activities. Camping is prohibited along Huntington Creek between Emery County's Bear Creek Campground and Manti-LaSal NF, because no restroom facilities are available in the area. Two visitor register boxes are located in Huntington Canyon.

Forest Planning Unit Extensive Recreation Management Area

Public lands in FPU offer dispersed recreation use. Visitor use statistics are not available for areas within FPU. Dispersed recreation activities include camping, picnicking, ORV use, hunting, fishing, and snowmobiling. No recreation facilities are provided within FPU.

VISUAL RESOURCES

Location and Extent of Resource

The planning area is characterized by scenic canyons, colorful geologic strata, terraced plateaus, and mesas bounded by steep cliffs. Spectacular scenic value lies in the area's exposed colorful rock layers, rugged and broken terrain, and naturally sculpted sandstone formations.

Cultural changes in the landform, water form, or vegetation create visual contrasts to the natural landscape character. In the planning area, these changes include oil and gas developments, powerlines, fences, pipelines, chainings, powerplants, reservoirs, mining operations, roads, and evidence of ORV use.

Allocations

Since it is neither desirable nor practical to apply the same management intensity to all visual resources, they must be evaluated to determine the appropriate management level.

Visual resource allocations involve classification as to scenic quality, visual sensitivity, and distance zones and the application of certain management objectives for visual resources in each VRM class (appendix M).

Scenic quality is classified as A, B, or C, with A being the most scenic. Table 39 lists the scenic quality classes, acreages, and percent of the planning area. Visual sensitivity, the degree of concern expressed by the user, is rated as high, medium, or low. Distance zones represent actual distances from an observation point or travel route and are designated as foreground/middleground, background, or seldom seen.

TABLE 39

Scenic Quality Class Acreages

Scenic Quality Class	SRRA Acres	SRRA Percent	FPU Acres	FPU Percent
A	472,050	32	0	0
B	538,720	37	51,470	68
C	453,080	31	23,880	32
TOTALS	1,463,850	100	75,350	100

Source: BLM records.

VRM classes, which are the result of inventory, form the basis for visual resource input into management decisions. The resulting VRM classes for the planning area are shown on map 82, and their acreages are listed in table 40.

TABLE 40

Visual Resource Management Class Acreages

VRM Class	SRRA Acres	SRRA Percent	FPU Acres	FPU Percent
Class I	0	0	0	0
Class II	492,230	34	4,140	5
Class III	378,230	26	5,040	7
Class IV	593,380	40	66,170	88
TOTALS	1,463,840	100	75,350	100

Source: BLM records.

Objectives of the four VRM classes are expressed as degrees of contrast that can be allowed in areas with various combinations of scenic quality, visual sensitivity, and distance zones (appendix M). The contrast rating process determines whether a proposed project would meet VRM class objectives. This process measures the level of change against the VRM class objective for the area in which a proposed project is to be located. To meet the objective, the project's level of visual change must be equal to or less than that allowed under the objective.

If the objective is met, little mitigation is needed to reduce visual contrast. If the objective is not met, reasonable and practical mitigation measures (which BLM management does not consider to be unduly economically restrictive) are applied to reduce contrasts as much as possible. The project is then approved with stipulations to implement the mitigation.

If, over time, sufficient projects occurred that did not meet class objectives, the scenic quality of an area would become degraded. At this point, the VRM class could not be maintained, and the class boundaries would have to be adjusted to shift the degraded area into a lower VRM class.

Resource Condition and Potential

Visual resource inventories for SRRA and FPU were begun in 1976 and completed in 1978. VRM class II, III, and IV areas were formally adopted in the San Rafael Management Framework Plan (MFP) [BLM, 1979a]. The foreground/ middleground zone along Highway I-70 was recommended for designation as a scenic corridor with no development allowed along I-70 between Highways U-24 and U-10.

The Sevier River MFP [BLM, 1977a] recommended that any activity disruptive to scenery, including, but not limited to, right-of-way structures, gravel pits, dumps, and vegetation conversions, be severely restricted in four visual corridors: (1) Highway I-70, (2) Rock Springs/Last Chance Road, (3) Highway U-72, and (4) Highway U-10.

The Multiple Use Management Plan for National Resource Lands in the San Rafael Swell [BLM, 1973] recommends that national resource lands within the visual corridor and service zone be withdrawn from all forms of entry, and that construction of buildings or structures outside road rights-of-way within the visual corridor be prohibited.

Cultural modifications are human-caused changes in the landform, water form, or vegetation, or the addition of a structure that creates a visual contrast in the basic elements of a landscape's natural character. In the planning area, these changes include, but are not limited to, fences, pipelines, chainings, powerplants, reservoirs, mining operations, roads, oil and gas developments, powerlines, and evidence of ORV use. Oil and gas developments and powerlines probably have the most significant adverse impact on the visual qualities of the area, and their influence is likely to continue.

VRM allocations are reviewed periodically, when the resource area staff determines that a review is needed. Changes to scenic quality, visual sensitivity, and distance zones are based on changing field conditions, and the VRM class is adjusted accordingly.

LANDS

Location and Extent of Resource

The land pattern in the planning area consists of

(1) private land, mostly in Castle Valley and along some of the drainages where the land was settled and farmed, along with a few scattered patented mining claims;

(2) state land, generally sections 2, 16, 32, and 36 of most townships, required in the Statehood Act for the support of schools, as well as other sections of land transferred to the state in lieu of unavailable school sections; and

(3) public land, most of which is in a blocked pattern with the state school sections interspersed, with some scattered, isolated parcels of public land in Castle Valley and in the western part of FPU.

Lands actions may be initiated by BLM or in response to an application. A lands action can take place anywhere in the planning area, subject to restrictions and conditions required by law, regulation, or management of other resource values.

Allocations

Land use allocations are made through a variety of means. Generally speaking, lands allocations fall into three broad categories: rights-of-way; other lands actions, such as leases and disposals; and withdrawals.

Certain authorizations, such as right-of-way grants, recreation and public purpose (R&PP) leases, and land use permits and leases, respond to public demand for specialized, more or less temporary uses of the public lands and do not cause the lands to leave the public domain, although they may restrict or benefit certain uses.

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They may be for a set period of time or may be open-ended. They tend to cover small, scattered areas.

No transportation or utility corridors have been designated in the planning area, but such corridors have been identified on lands that border the planning area.

State lands were identified for possible acquisition where they would enhance or facilitate management of special designation areas. These include lands within the I-70 Scenic Corridor, Dry Lake Archaeological District, Tomsich Butte Historical District, Little Black Mountain, The Wedge, Muddy Creek, and Big Flat Tops ACECs.

Disposal actions, usually in response to public requests or applications, result in a title transfer, and the lands leave the public domain. Examples are state indemnity selections, private or state exchanges, desert land entries, public sales, and mineral patents. Disposal may depend upon the recipient's meeting certain conditions, such as in an R&PP patent, or may be absolute, as in a sale. These tend to involve scattered, discrete parcels.

Each proposal or application is considered on a case-by-case basis and either authorized or rejected. Rights-of-way have been authorized in the planning area for oil and gas lease access and pipelines, off-lease coal facilities, electric power transmission and distribution lines, county road system changes, telephone lines, primary and secondary water systems and pipelines, access to private land, etc. Other land actions include R&PP leases for recreation facilities and a public school; permits for short-term uses such as motion picture filming, geologic core sampling, and seismograph lines not connected with the minerals program; sales of land in response to public requests or sales of isolated tracts identified by BLM for disposal; and exchanges of land. Existing land leases are shown on map 30.

Withdrawals withhold lands from disposal or other types of appropriation to maintain certain resource values or to reserve the lands for a particular purpose. They may be imposed only by the Secretary of the Interior or by Congress (see Section 204 of FLPMA). A withdrawal may remove areas from the public lands to be managed under the the authority of another federal agency or department, but the land does not leave federal ownership. Withdrawals remain in effect until specifically revoked. The RMP can serve as a basis for recommendations through administrative channels that lands be withdrawn from certain uses or appropriations.

Resource Condition and Potential

The condition of other resources must be considered when processing lands cases. These resource conditions may necessitate restrictions or conditions to be met in authorizing lands actions or may cause a proposed action to be rejected. Overall, there should be no problem in meeting the demands for rights-of-way, leases, permits, community expansion, and other lands actions although, on a case-by-case basis, some proposed actions may not be authorized.

In 1968 the public lands in Emery County, except certain specified lands, were classified for retention and multiple use management under the authority of the Classification and Multiple Use (C&MU) Act of September 19, 1964, and in accordance with 43 CFR 2400. The classification segregated the lands from appropriation under the agricultural land laws and from sales under R.S. 2455 (43 U.S.C. 1171). In addition, those lands shown in table 41 were also segregated from entry under the general mining laws and from surface use and occupancy under the mineral leasing laws. Under the withdrawal review program the classification was removed and no lands are classified under the C&MU Act.

Rights-of-way across the public lands are generally granted under Title V of FLPMA and Title I of the Mineral Leasing Act (43 CFR 2800). These are issued for many purposes and change over time (are granted and expire). They are generally recorded on the master title plats found at the SRRA and Sevier River Resource Area offices, Moab and Richfield diestrict offices, and at the USO, but are not shown on a map.

The lands leased for R&PP are segregated from entry under the public land laws including the mining laws (43 CFR .2091.3-2) (map 30).

TABLE 41

Bureau of Land Management Classifications

Site	Acres Classified
San Rafael Bridge campground	80
The Wedge recreation area	120
Link Flats Natural Area	792
TOTAL	992

Source: Master Title Plats

Though minerals remain reserved to the United States, there is no provision for mineral entry or development on R&PP patents. R&PP patents contain provisions allowing for reversion of the lands to the United States under certain circumstances.

The Huntington Airport lease, issued under 43 CFR 2911 to Huntington City and transferred to Emery County, covers 320 acres near Huntington (map 30). In accordance with the regulations, these lands are segregated from mineral location. Approximately 40 to 60 acres of the lands under lease are not currently being used as part of the airport.

As of August 1986, 7,710 acres within SRRA and 180 acres within FPU were under withdrawal by BLM as public water reserves (PWRs) (map 39). A PWR is segregated from agricultural entry and ultimately from disposal.

Four powersite withdrawals affect 34,020 acres within SRRA (map 39). BLM manages the surface with concurrence of the Federal Energy Regulatory Commission (FERC), the withdrawing agency. The FERC withdrawals are for possible powersite developments. Three withdrawals are located on the Green River, and one withdrawal on the Green and San Rafael Rivers (table 42).

TABLE 42

Lands Actions Supporting Public Demands

Lands Action and Site	Economic Activity Enhanced	Acres
Agency withdrawals (SRRA)		
FERC	energy	34,020
R&PP patents (SRRA)		
Goblin Valley State Park	recreation	2,240
Emery Rodeo Grounds	recreation	40
Bear Creek Campground	recreation	120
Clawson Cemetery	infrastructure	10
SUBTOTAL		2,410
R&PP leases (SRRA)		
Goblin Valley Extension	recreation	720
Millsite Park	recreation	40
Millsite Golf Course	recreation	190
Clawson Motocross	recreation	160
Castle Dale Fairgrounds	recreation	290
Emery School	infrastructure	40
SUBTOTAL		1,440

Source: BLM Records.

Short-term land permits are issued as needed. These permits are for short-term uses such as filming and seldom number more than five at any one time. Because of their short duration and minimal effect, they are not shown on a map.

Lands managed for disposal must meet the criteria of the specific authority including Section 203 of FLPMA (see also 43 CFR 2710).

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The San Rafael MFP identified 26 isolated tracts as suitable for disposal, three of which have been sold. Other lands were not included in the MFP but are suitable for disposal.

The Sevier River MFP recommended transfer of 840 acres of isolated public land to the USFS or to Johnson Livestock Company through an exchange. The transfer or exchange did not take place; 640 acres south of I-70 and 200 acres north of I-70 are to be offered for sale. Other lands were not included in the MFP but are suitable for disposal.

Some occupancy or agricultural trespass is known or suspected to occur in the planning area. It usually occurs adjacent to private land, is generally considered to be inadvertent or unintentional, and usually involves fewer than 5 acres.

The potential right-of-way corridors within the planning area would continue some of these corridors along the routes already established by existing groupings of rights-of-way (map 24). The Western Regional Corridor Study [Western Utility Group, December 1986] was considered in developing the potential utility corridor.

ECONOMIC CONSIDERATIONS

The format for this section includes an overview of the affected area, followed by a detailed discussion of the economic activity that would be most impacted by the alternative management actions. Economic measures emphasize personal, local, and regional revenues, costs, earnings, wealth, and employment.

Most management actions would primarily affect Emery County. Although Carbon County lies outside the planning area, it is included in the discussion because there is a strong trading, and commuting link between Carbon and Emery Counties. Most information is presented for both Emery County and the Carbon-Emery County area. The strong economic link between the two counties prevents isolating the economic importance of planning area activities to Carbon County.

Some economic activity in Sevier and Sanpete Counties relies on resources within the planning area (mostly coal and livestock forage); however, none of the actions proposed in any of the alternatives would affect economic activity in either of these two counties. For a more complete description of the methodologies and assumptions used in this section, refer to appendix P.

DEMOGRAPHICS

The 1987 Carbon and Emery County populations were 22,400 and 11,600 respectively, about 1.3 percent and 0.7 percent of the state's population respectively [Barber and Taylor, 1987]. Most of the settlement in Emery County is located in Castle Valley, the northwestern part of the county. There are two service centers in northwestern Emery County: Castle Dale, the county seat (1986 population 2,070) and Huntington (1986 population 2,350) [Utah, 1987]. Other towns in Castle Valley are Elmo (population 350), Clawson (population 100) Cleveland (population 560), Orangeville (population 1,570), Ferron (population 1,910), and Emery (population 400). The Town of Green River is located in the southeastern part of the county and has a population of 920.

The Carbon-Emery County region experienced a 62 percent increase between 1970 and 1980, and during this period Emery County experienced the highest rate of growth in the state [USDC, 1981a]. Much of this growth can be traced to the construction of the Castle Dale Power Complex and the Huntington Canyon Power Complex. The towns nearest to the plants grew most rapidly. Huntington became the largest city in the county, growing 10.45 percent annually. The neighboring towns of Castle Dale, Ferron, and Orangeville had annual growth rates of 13.44 percent, 10.00 percent, and 9.86 percent respectively during the 1970s. Although Green River was the largest city in the county in 1970, its location on the eastern border of the county excluded it from energy-related growth. Consequently, Green River was the only city in the region to lose population between 1970 and 1980. The coal industry has declined since 1980, resulting in out-migration from the region. Between 1982 and 1986 Carbon and Emery Counties experienced 7 and 9 percent population decreases respectively [Barber and Taylor, 1987].

Emery County contains 4,449 square miles of land or about 2 million acres. About 82 percent of the county is owned by the Federal

Government, 10.7 percent by the State of Utah, and 7 percent by the private sector.

EMPLOYMENT AND EARNINGS

Growth and decline in Carbon and Emery Counties are linked with the coal industry. The industry has experienced a recent contraction but has remained stable over the past several years. The mining industry is the largest employer, and accounts for the largest share of earnings in the region. The construction and operation of electricity-generating plants also provide a large share of employment in the area. The local earning and employment attributable to these powerplants is reflected the construction, public utilities, and mining sectors, see tables 43 and 44. A number of other businesses depend on the mines and powerplants to purchase their products, and many retail and service businesses depend on the workers' local expenditures.

Agriculture, and more recently coal, have formed Emery County's economic base. Powerplant construction and an expansion of coal production transformed many of the communities in the area. Huntington, Castle Dale, Orangeville and Ferron have been most affected by the increased mining and electricity generation. Cleveland, Elmo and Emery have been changed to a lesser degree. Green River, located on Highway I-70, has become increasingly dependent on tourism.

Price (1986 population 8,980) has been the coal capital of Utah since the early 1900s, and has always served as a regional trading center [Utah, 1987]. East Carbon, Hiawatha, and Sunnyside (populations 1,660, 240, and 500, respectively) all developed as company towns for the coal industry. Helper (population 2,724) is also a coal town, but has a more diversified economy. Scofield (population 105) is an old coal mining community. Wellington (population 1,640), unlike the rest of the county, is a farming, trade, and residential center.

COMMUNITY INFRASTRUCTURE

Neither community infrastructure nor the levels of services provided by communities in Carbon and Emery Counties would be affected by any of the alternatives.

TABLE 43

1986 Employment for Utah and for Carbon and Emery Counties

Industry	Utah (percent)	Emery County (percent)	Carbon County (percent)
Farm	2.5	10.7	2.7
Nonfarm			
Private			
Ag Services	0.6	0.3	0.3
Mining	1.1	23.4	15.3
Construction	5.7	5.3	4.0
Manufacturing	11.9	0.3	2.8
Trans. and Utilities	5.1	20.5	5.3
Wholesale	4.7	0.7	3.7
Retail	16.7	8.7	19.4
Fire	7.4	1.7	3.5
Services	24.5	10.9	22.9
Government			
Federal	7.2	2.8	3.7
State and local	12.4	14.5	16.6
Total employment (jobs)	800,649	4,820	9,468
Employment (UDES)	634,138	3,682	7,465
Labor force			
Participation (percent)	45.3	34.1	38.7
Unemployment rate (percent)	6.0	12.4	10.1

NOTE: Includes proprietor and wage and salary employment.

Sources: UDES, 1986; BEA, 1988.

TABLE 44

1986 Industry Earnings for Utah and for Carbon and Emery Counties

Industry	Utah (percent)	Emery County (percent)	Carbon County (percent)
Farm	1.0	1.8	1.2
Nonfarm			
Private			
Ag Services	0.3	0.1	0.1
Mining	2.3	41.3	35.7
Construction	7.4	4.8	5.1
Manufacturing	16.8	0.1	2.3
Trans. and Utilities	8.5	31.6	8.9
Wholesale	6.4	0.6	4.6
Retail	1.0	2.7	9.1
Fire	5.5	0.6	2.1
Services	20.3	5.5	13.8
Government			
Federal	8.7	1.1	3.3
State and local	12.8	9.4	13.8
Total earnings ($000)	$14,107,930	$121,415	$181,885
Total personal income ($000)	$18,296,370	$105,474	$268,497
Per capita personal income	$10,986	$8,634	$11,851

Sources: UDES, 1986; BEA, 1988.

FISCAL CONDITIONS

Property taxes are a major source of income for taxing districts in Carbon and Emery Counties. These districts also receive a large portion of their revenue from intergovernmental transfers including federal payments in lieu of taxes (PILT) and state reallocation of fuel taxes and vehicle registration fees. See tables 45 and 46.

RELATED ECONOMIC ACTIVITY

Minerals

In 1985 the average annual employment in Emery County's oil and gas extraction industry was 52 jobs [UDES, 1986]. Permanent residents of the area are usually employed for oil and gas production, while drilling and geophysical exploration mostly employ nonresidents.

Including indirect and induced affects, oil and gas activity in the planning area generates 57 jobs (40 percent of which are held by residents), $1,606,871 earnings, and $21,892 taxing district revenues in Emery County and 90 jobs, $1,983,609 earnings, and $55,921 taxing district revenues in the Carbon-Emery County area (tables 45, 46, 47, and 48).

Oil and gas drilling and geophysical exploration have decreased significantly since 1985, as has their related local importance.

In 1985, the average annual employment in Emery County's coal industry was 1,099 jobs, and the average annual employment in Sevier County's coal industry was 260 jobs [UDES, 1986]. Approximately 75 percent of the coal produced in Emery County is used in coal-fired powerplants within the county. These plants and the related local economic activity depend entirely on coal produced in Emery County, 80 percent of which is produced from the planning area.

Including the indirect and induced effects, coal originating from the planning area generates a total of 5,198 jobs, $110,874,906 of earnings, and $22,636,516 of taxing district revenues in Carbon, Emery, Sevier, and Sanpete Counties. By place of employment, 2,916 of the jobs, $75,766,196 of the earnings, and $16,283,412 of taxing district revenues are in Emery County; 1,701 of the jobs, $23,611,990 of the earnings, and $4,892,076 of the taxing district revenues are in Carbon County; 55 of the jobs, $109,941 of the earnings, and $89,485 of the taxing district revenues are in Sanpete

TABLE 45

Taxing District Revenues, by Source, Carbon and Emery Counties (1985)

		Attributable to Land Use Activity in the Planning Area							
Source	Total Taxing District Revenues	Oil and Gas Activity	Coal and Electric Generation	Nonmetal Mineral Activity[a]	Metal Mining Activity[b]	Livestock Production	Recreation-Related Activity	Wildife-Related Activity	Other Land Use Activities
Taxes	$27,299,532	$21,935	$15,681,258	$1,265	$5,147	$442,169	$19,314	$11,797	$23,229
Licenses and permits	$370,401	$323	$50,787	$25	$66	$2,682	$407	$249	$490
Intergovernment	$17,122,706	$29,400	$4,617,000	$2,300	$6,000	$243,800	$37,000	$22,600	$44,500
Charges for Services	$2,005,188	$1,382	$216,999	$108	$282	$11,458	$1,739	$1,062	$2,092
Fines and forfeitures	$472,724	$294	$46,170	$23	$60	$2,438	$370	$226	$445
Miscellaneous	$4,710,999	$3,587	$563,274	$281	$732	$29,744	$4,514	$2,757	$5,429
TOTALS	$51,981,550	$56,921	$21,175,488	$4,002	$12,287	$732,291	$63,344	$38,691	$76,185

[a] Nonmetal mineral activity includes mineral materials such as stone, sand, and gravel.

[b] Metal mining activity includes locatable minerals such as uranium/vanadium and gold, as well as mining claim assessment activities.

Sources: Utah, 1985; Hansen, et al., 1986; Utah State Tax Commission, 1986.

TABLE 46

Taxing District Revenues, by Source, Emery County (1985)

		Attributable to Land Use Activity in the Planning Area							
Source	Total Taxing District Revenues	Oil and Gas Activity	Coal and Electric Generation	Nonmetal Mineral Activity[a]	Metal Mining Activity[b]	Livestock Production	Recreation-Related Activity	Wildife-Related Activity	Other Land Use Activities
Taxes	$27,299,532	$9,703	$13,271,184	$450	$3,071	$160,126	$5,544	$4,884	$8,844
Licenses and permits	$370,401	$12	$2,916	$2	$4	$157	$21	$19	$34
Intergovernment	$17,122,706	$11,800	$2,916,000	$1,500	$4,000	$156,700	$21,000	$18,500	$33,500
Charges for Services	$2,005,188	$118	$29,160	$15	$40	$1,567	$210	$335	------
Fines and forfeitures	$472,724	$35	$8,748	$5	$12	$470	$63	$101	------
Miscellaneous	$4,710,999	$224	$55,404	$29	$76	$2,977	$399	$637	$2,757
TOTALS	$51,981,550	$21,892	$16,283,412	$2,001	$7,203	$321,997	$27,237	$24,476	$45,135

[a] Nonmetal mineral activity includes mineral materials such as stone, sand, and gravel.

[b] Metal mining activity includes locatable minerals such as uranium/vanadium and gold, as well as mining claim assessment activities.

Sources: Utah, 1985; Hansen, et al., 1986; Utah State Tax Commission, 1986.

TABLE 47

Carbon and Emery County 1985 Employment and Earnings by Economic Activity in Emery County and the Planning Area (by place of employment)

	Direct, Indirect, and Induced Effects			
	Attributable to Emery County Activity		Attributable to Planning Area Activity	
Economic Activity	Employment (jobs)	Earnings (dollars)	Employment (jobs)	Earnings (dollars)
Oil and gas	148	2,614,242	90	1,983,609
Coal & Electric	5,495	120,264,127	4,617	99,378,186
Metal Mining[a]	25	413,147	6	97,653
Non Metal Mining[b]	NA	NA	2	37,775
Livestock grazing	516	2,357,848	244	1,112,791
Recreation use	700	7,233,369	38	386,993
Wildlife use	67	694,482	23	232,696
Other	NA	NA	48	644,766

[a] Locatable mineral including uranium/vanadium, gold, and mining claim assessment activities.

[b] Mineral materials including stone, sand, and gravel.

Sources: UDES, 1986; USDC, 1985a; USDC, 1985b; USDC, 1985e; USDC, 1985f; IORT, 1984; Dalton, 1982; Various officials of Southern Utah Fuel Company; Trail Mountain Mine; Emery Mine; Utah Power and Light Company, Mining Division; and Bear Canyon Mine; personal communications, February 1987; USFS, 1982; and BLM records.

TABLE 48

Emery County 1985 Employment and Earnings by Economic Activity in Emery County and the Planning Area
(by place of employment)

	Direct, Indirect, and Induced Effects			
	Attributable to Emery County Activity		Attributable to Planning Area Activity	
Economic Activity	Employment (jobs)	Earnings (dollars)	Employment (jobs)	Earnings (dollars)
Oil and gas	82	1,850,278	57	1,606,871
Coal & Electric	3,523	93,480,362	2,916	75,766,196
Metal mining[a]	16	310,464	4	75,257.0
Non Metal Mining[b]	NA	NA	1	28,384.5
Livestock grazing	217	645,509	157	463,174
Recreation use	387	3,402,582	21	182,052
Wildlife use	44	385,781	18	159,333
Other Uses	NA	NA	36	494,767

[a] Locatable mineral including uranium/vanadium, gold, and mining claim assessment activities.

[b] Mineral materials including stone, sand, and gravel.

Sources: UDES, 1986; USDC, 1985a; USDC, 1985b; USDC, 1985e; USDC, 1985f; IORT, 1984; Dalton, 1982; Various officials of Southern Utah Fuel Company; Trail Mountain Mine; Emery Mine; Utah Power and Light Company, Mining Division; and Bear Canyon Mine; personal communications, February 1987; USFS, 1982; and BLM records.

County; and 526 of the jobs, $11,086,779 of the earnings, and $1,371,543 of the taxing district revenues are in Sevier County (tables 45, 46, 47, and 48).

Although coal production and related economic activities are significant in all four counties and have played a major role in the economic and social conditions of the area, none of the proposed alternatives would affect these activities, and no further discussion is warranted.

The mineral materials in the planning area that generate the most economic activity include sand and gravel, stone, clay, and fill dirt. No businesses in Emery County are directly involved in the production and sale of these resources; however, some economic activity is generated by the production of mineral materials for use in the manufacture of other products. Sand and gravel are used primarily in road construction and maintenance; stone is used primarily for riprap (channel bank stabilization) and decorative building material; and clay is used to stabilize soils and line reservoirs.

Countywide production of mineral materials is unknown. Including indirect and induced affects, extracting mineral materials from the planning area generates 1.5 jobs, $28,384 earnings, and $2,001 taxing district revenues in Emery County and 2 jobs, $37,775 earnings, and $4,002 taxing district revenues in the Carbon-Emery County area (tables 45, 46, 47, and 48).

Although mineral materials are commonly available from other nearby lands, their location with respect to their point of end use often makes materials in the planning area a less costly source of supply.

There is no active metal mining in either Emery County or the planning area. During the 1960s, uranium mining was an important local industry; however, the industry declined in importance during the 1970s, and since 1983 there has been no local production. The only existing metal mining activity is associated with exploring and developing mining claims. Based solely on the notices of intent and plans of operation received (ignoring some non-surface-disturbing expenditures) approximately $160,000 was spent on assessment work in the planning area. These local expenditures, including their indirect and induced effects, generate 4 jobs, $75,257 earnings, and $7,203 taxing district revenues in Emery County and 6 jobs, $97,653 earnings, and $12,287 taxing district revenues in the Carbon-Emery County area (tables 45, 46, 47, and 48).

Soil, Water, and Air

Wind erosion, flooding, salinity, sedimentation and soil productivity are the major soil- and water-related concerns that can affect economic activity.

Soil productivity and related economic activity are discussed under livestock and wildlife-related recreation.

Wind erosion has increased road maintenance costs along Highway U-24. Flooding from planning area watersheds has occasionally resulted in downstream economic losses.

Salt loading and salt concentration from the planning area affect water users in the lower Colorado River basin. For municipal and industrial users downstream, higher salt concentrations increase water treatment costs, pipe corrosion, appliance wear, and soap and detergent needs, while decreasing the palatability of the water. For those who irrigate, the higher salt concentrations cause decreased crop yields, loss of productive land, increased leaching and draining needs, and increased management costs, sometimes making it necessary to change to a more salt-tolerant crop.

Several studies [Kleinman, et al., 1974; Kleinman and Brown, 1980; BOR, 1980] have attempted to quantify the downstream user cost of increasing salinity levels in the Colorado River. BOR updates these figures using gross national product (GNP) price deflators along with projected baseline salinity levels to estimate impacts of salinity control and water development projects (table 49). These figures do not account for all salinity costs, and they do include indirect costs which, under conditions of capital and labor mobility, are not true cost from a national perspective.

TABLE 49

Increased Water-User Cost of Increasing Salinity at Imperial Dam by 1 Milligram per Liter

Dollar Year	GNP Implicit Price Deflator	Direct Incremental Impact	Indirect Incremental Impact	Total Incremental Impact
1976	133.7	$257,300	$ 85,700	$343,000
1977	141.7	272,600	90,900	363,500
1978	152.0	292,425	97,475	389.900
1979	165.5	318,500	106,100	424,600
1980	174.5	335,800	111,900	447,700
1981	185.1	356,000	119,000	475,000
1982	201.7	388,000	129,000	517,000
1983	210.3	405,000	135,000	540,000
1984	218.2	420,000	140,000	560,000
1985	226.1	435,000	145,000	580,000

Source: Kleinman and Brown, 1980; BOR, 1985.

Drainages from the planning area contribute an estimated 342,000 tons of salt into the Colorado River system annually. The annual downstream cost resulting from salt loading amounts to an estimated $20 million. Salt loading from public lands is unknown.

The use of many capital investments including streets, buildings, sewers, reservoirs, irrigation ditches, and culinary water systems can be severely hampered with sediment. Either the sediment has to be removed to regain use of the capital investment, or the use of the capital investment will deteriorate over time.

Because sediment yields cannot be quantified, their economic significance cannot be quantified. Sedimentation of capital investments has generally been a problem only at Lake Powell and livestock reservoirs in high-erosion areas, and it is projected to become a problem for the Joes Valley-Huntington Canal within the next 10 years.

Livestock

Agriculture was Emery County's major economic base in the late 1800s and early 1900s. Since the early 1900s, agriculture has declined in relative importance, but remains a stable industry and is the county's second largest source of employment. In 1984, agriculture directly accounted for 495 jobs (10 percent of local employment) and earnings of $583,000 in Emery County (5 percent of local earnings) [USDC, 1985a]. Livestock is the county's major agricultural product, accounting for 56 percent of all agricultural sales in 1982 [USDC, 1982].

The planning area supplies forage for livestock not only in Emery County, but also in Carbon and Sevier Counties. Eighty-eight percent of the operators reside in Emery County, 5 percent in Carbon County, and 3 percent in Sevier County.

One hundred thirty-eight active livestock operators have been identified. Of the 132 cattle operators, 81 have a herd size of under 100 head and 51 have a herd size of greater than 100 head. There are 9 sheep operators.

Of the 138 operators who graze livestock in the planning area, 37 (23 percent) have been identified as full-time operators, a proportion significantly lower than the state's 44 percent average

[USDC, 1982]. Fourteen of the 37 full-time operators identified are retired from other occupations. The availability of better-paying alternative employment is a major reason for the low proportion of full-time operators.

Livestock operators who use public rangeland forage in the planning area and reside in Emery County account for 73 percent of the county's livestock production; those residing in Carbon County account for 8 percent of that county's livestock production; and those residing in Sevier County account for 3 percent of Sevier County's livestock production.

The majority of livestock operators have cow-calf operations. Generally, cows are calved in early spring, and the calves are then sold in late fall. Planning area forage is important in maintaining the cow herd during the winter and providing nutritious forage in spring when cows are calving. On the average, these operators depend on public rangeland forage to provide 35 percent of their livestock feed (table 50).

Ranch budgets have been developed for six livestock groupings. Each ranch has a unique set of characteristics affecting its operation that cannot be fully represented by models of typical ranches. However, data from these typical ranch budgets can be used to estimate aggregate costs, returns, hired labor, and ranch values. These aggregate statistics are summarized in table 51.

The budgets suggest that over 100 head of cattle are generally needed to support a full-time operator. With existing economic conditions, most operators, particularly those with a low debt load, can earn a return above their variable cost. However, returns to family labor and investment are lower than existing market rates of return, and returns to risk and management are generally negative. Although these conditions vary, depending particularly on management ability and debt loads, there does not appear to be much economic incentive to stay in the livestock business. Higher earnings in other county industries have drawn many operators to alternative employment and have led many to convert their operations into part-time businesses.

TABLE 50

Dependency on Planning Area Forage by Season of Use

	AUMs Average Use		Percent Dependency	
	Cattle	Sheep	Cattle	Sheep
January	6,221	530	47	61
February	6,147	530	47	61
March	7,044	327	54	38
April	6,940	204	53	23
May	6,692	116	51	13
June	3,061	25	0.23	2
July	990	7	0.07	0
August	992	0	0.07	0
September	1,223	0	0.09	0
October	2,231	310	0.17	36
November	6,030	364	0.46	42
December	6,917	364	0.53	42
TOTAL	54,494	2,777	37	27

[a] Dependency represents the percentage of total feed requirements supplied by forage from the planning area.

[b] Numbers are not additive because of rounding.

Source: BLM records.

TABLE 51

Preliminary Aggregate Costs and Returns for all Operators Grazing in the Planning Area

	1984 Dollars		
	Cattle	Sheep	Total
Gross revenues	$2,635,577	$306,119	$2,941,696
Variable cost	$1,885,423	$130,329	$2,015,752
Returns above variable costs	$750,154	$175,790	$925,944
Returns to family labor and investments	$28,593	$138,332	$166,925
Ranch Value	$23,648,843	$2,779,400	$26,428,243

Source: BLM Records.

Escalating farm real estate values between 1970 and 1981 contributed to fair market returns; however, this economic incentive has diminished as farm real estate values have remained static since 1981 [Drabenstott and Duncan, 1984; Federal Reserve Bank of Kansas City, 1987].

Based on the ranch budgets for the direct effect, and the indirect and induced effect derived from county economic models, it is estimated that local operators who use planning area forage generate 157 jobs, $463,174 earnings, and $321,997 taxing district revenues in Emery County and 244 jobs, $1,112,791 earnings, and $732,291 taxing district revenues in the Carbon-Emery County area (tables 45, 46, 47, and 48).

Although BLM does not recognize a capitalized value for grazing preferences, the market recognizes such a value whenever grazing fees are lower than their true economic worth [USDA and USDI, 1977]. Recent permit sales in the area have ranged from $20 to $75 per AUM. Local private lease rates for forage also suggest that grazing fees are lower than their true economic worth [Tittman and Brownell, 1984].

There is some uncertainty as to how much of a permit's value, if any, is capitalized in an operator's base property. Although most operators have purchased their grazing privileges from other operators, the uncertain nature of both future grazing privileges and grazing fees may have reduced much of the previously capitalized value. If a permit's value is $50, and the entire permit value is capitalized in the ranch's value, then grazing privileges in the planning area account for $4.2 million, about 16 percent of the aggregate ranch value of operators using planning area forage [USDC, 1982].

Recreation

Recreation-related purchases of goods and services have spinoff earnings, employment, population, and fiscal effects.

Table 52 presents visitor use statistics by region. Emery County receives significant resident and nonresident use, some of which is due to attractions within the planning area. Approximately 50 percent of the tourists traveling through the county actually visit attractions within the county. Approximately 10 percent of those who visit attractions in the county visit attractions in the planning area.

TABLE 52

Estimated Number of Annual Recreation Visits, 1979-1984

Region	Resident In Community	Resident Out of Community	Nonresident	Total
Southeastern District	967,800	944,400	1,623,700	3,535,900
Castle Country Region	604,343	401,370	744,400	1,750,113
Emery County	451,007	301,028	558,300	1,310,335
Planning Area				70,075

NOTE: The Southeastern district includes Carbon, Emery, Grand, and San Juan Counties. The Castle Country region includes Carbon and Emery Counties.

Source: IORT, 1984; Dalton, 1982; BLM records.

Including indirect and induced effects of recreation related expenditures, recreation in the planning area generates 21 jobs, $182,052 earnings, and $27,237 taxing district revenues in Emery County and 38 jobs, $386,993 earnings, and $63,344 taxing district revenues in the Carbon-Emery County area (tables 45, 46, 47, and 48).

Three commercial river operators use the San Rafael River, and approximately eight commercial river operators use the Green River through Labyrinth Canyon. Commercial use of the San Rafael River generates an estimated $1,600 of sales per year; however, commercial use has just begun in this area and is projected to increase. None of the commercial operators using the San Rafael River is local.

Based on recorded use, Labyrinth Canyon generates an estimated $8,000 of sales for the eight outfitters using the area. However, these sales comprise only a small part of each operator's total business. Three of the eight outfitters are located in Green River, Utah.

Some recreational visitation and therefore jobs, earnings, and taxing district revenues in the county can be attributed to consumptive and nonconsumptive wildlife uses (table 53). Public lands within the planning area account for only a portion of wildlife habitat for most species. Based on the proportion of the habitat for each species that lies on public lands, wildlife-related activities in the planning area generate 18 jobs, $159,333 in earnings, and $24,476 in taxing district revenues in Emery County and 23 jobs, $232,696 in earnings, and $38,691 in taxing district revenues in the Carbon-Emery County area (tables 45, 46, 47, and 48).

Tourism's importance is greatest in Green River, less in Castle Valley. The industry forms a fairly stable economic base, which has been growing with the regional population. The industry does experience annual fluctuations and is highly susceptible to economic recessions. However, these fluctuations are not of the size or duration of mining booms and busts. A larger proportion of temporary jobs with relatively low salary levels are associated with the recreation industry, particularly with the businesses most dependent upon tourism.

TABLE 53

Estimated Total Use of Wildlife Herds that Extend into Emery County and the Planning Area

Wildlife Use	Activity Days Emery County	Activity Days Planning Area
Consumptive use	73,385	18,391
Primary nonconsumptive use	95,401	23,908
TOTALS	168,786	42,299

Sources: Jense, et al. 1986; Leatham and Roberson, 1985; Leatham, et al., 1986; UDWR, 1986; Provan, et al., 1980; USFWS, 1982.

Other Land Uses

Other economic uses of public lands in the planning area include:

- land use permits for filming and miscellaneous temporary facilities;
- rights-of-way for access, transportation, utilities, and water structures;
- sales for residential, agricultural and commercial uses; and
- R&PP patents for lands used for recreation and other public purposes.

Including indirect and induced effects, other land uses over the past 3 years have generated an annual average of 36 jobs, $494,767 earnings, and $45,135 taxing district revenues in Emery County and 48 jobs, $644,766 earnings, and $76,185 taxing district revenues in the Carbon-Emery County area (tables 45, 46, 47, and 48).

Counties receive a PILT for entitlement land within their boundaries. In 1985 Emery County received $410,521 in PILT [BLM, 1985b]. The payment is based on both congressional appropriations to the fund and either the county's entitlement acreage or the county's population. Payments can be as high as $0.75 per acre. Emery County's population currently limits PILT, and 1,735,371 acres of entitlement lands could be transferred to alternative ownership before PILT payments to the county would be reduced. Payments to the county now average $0.18 per acre.

PILT payments per acre are generally far lower than revenues the county receives on lands under alternative ownership. Only entitlement land transfers to the state could reduce local jurisdictional revenues, and then only if over 1,735,371 acres of entitlement lands were transferred to state ownership.

SOCIAL CONDITIONS

The history and development, and therefore social conditions, of Carbon and Emery Counties have been dissimilar.

The Castle valley area of Emery County was originally settled by Mormon pioneers, and economic development was based mostly on agriculture. Communities in the area remained small, isolated, and culturally homogeneous. Cultural values emphasized personal independence, local government, and local control.

During the 1970s, nearby energy developments brought rapid population and economic growth and significant in-migration to the area. The residents had little experience in coping with growth-related problems, and the in-migration of a culturally diverse population resulted in rapid changes to social conditions.

The recent downturn in the coal industry has exposed residents to the other side of rapid growth, with high unemployment rates, out-migration, and reduced taxing district revenues after having financed large a infrastructure buildup during the "boom." Cultural and economic diversity have increased, although not to the extent of the diversity in Carbon County, and communities have more experience and are better equipped to deal with future energy-related growth. These changes are more pronounced in northern Castle Valley and less pronounced in the southern part.

Carbon County was originally settled like Emery County, but in 1881 with the decision to route the Denver and Rio Grande Railroad through Price, coal mining soon became the area's major industry. Through the years, this economic development has brought in a culturally diverse population and has forced communities in the area to deal with boom-bust growth ever since. Communities in Carbon County are politically and economically diverse and displayed a high level of cooperation and coordination during the last boom-bust cycle.

Federal agencies have exerted increasing management and control over land upon which the local economy depends. Residents are sensitive to federal actions that either restrict traditionally unrestricted activities or appear to have a negative effect on economic conditions, particularly during the current economic slump and high rates of unemployment. However, public land--much of it undeveloped--is an important component of the lifestyle many local residents desire.

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Chapter 4

CHAPTER 4, ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

Chapter 4 presents the environmental consequences or impacts of the six alternatives described in chapter 2. The impacts depict the projected change that would occur in the human environment by the year 2000 if the alternatives were implemented. Impacts were summarized in chapter 2, table 11.

All of the alternatives would meet the requirements of the National Environmental Policy Act (NEPA) and other environmental-quality-related laws, regulations, and policies, including the requirement to prevent unnecessary and undue degradation of the public lands and resources, as prescribed by the Federal Land Policy and Management Act of 1976 (FLPMA). However, because the alternatives are quite different, each would have an environmentally preferable result for different components of the human environment.

Alternative A presents a continuation of current management.

Alternative B would be the least restrictive to development of minerals resources and livestock uses.

Alternative C favors nonmotorized recreation and would allow wildlife to attain prior stable numbers.

Alternative D would enhance watershed conditions and provide maximum cultural resource protection. This alternative would be the most restrictive to surface-disturbing land uses.

Alternative E presents opportunities to maximize motorized recreation (off-road vehicle (ORV)) and provides maximum opportunity for access development.

Alternative F, the Bureau of Land Management's (BLM's) preferred alternative, represents a mix of the other alternatives.

Following the impact analysis in this chapter is a discussion of

(1) unavoidable adverse impacts under the alternatives;

(2) the relationship between short-term use of the human environment and maintenance and enhancement of long-term productivity; and

(3) the major environmental consequences and irreversible or irretrievable commitments of resources.

ANALYSIS METHODS

Not all environmental components would be affected by the alternatives analyzed. For example, no impacts would occur to air quality under any alternative. The present (1988) condition of those that would be changed by implementing any of the six alternatives was described in chapter 3.

Specific indicators were listed in chapter 3, table 12. Change (impact) is measured in increase or decrease of a specific environmental indicator, such as acres open for oil and gas leasing.

Changes to some facets of the human environment (for example, visitor-use days) could not be projected because they would depend on factors other than the alternatives presented, and so were not used as environmental indicators.

The environmental baseline is alternative A, which represents no action, or no change in management (continuation of management under the management framework plans (MFPs) [BLM, 1977a and BLM, 1979a]. The change to each component that would occur by the year 2000 under current management is described under alternative A. The environmental consequences of management under the other alternatives are compared to the change that would occur under alternative A.

Impacts are seldom known with certainty and must be based on certain assumptions. Broad planning assumptions, which have guided development of all phases of this resource management plan (RMP) were given in chapter 1.

Assumptions for surface disturbance caused by resource use and development are stated in table 54. These were used to project secondary impacts, such as soil loss. The assumptions for projecting impacts to specific indicators are given for the components under each alternative.

The impact of surface restrictions on mineral production depends on the quality and quantity of the mineral in place, which cannot be determined prior to exploration and development. The potential for minerals occurrence, however, can be projected. For each mineral commodity assessed, appendix Q shows the correlation of mineral potential with surface restrictions under each alternative, based on potential as discussed in chapter 2.

To analyze impacts to livestock forage and grazing use, changes were projected by alternative for each grazing allotment. The anticipated change in ecological condition, by allotment, is shown in appendix R. Appendix I shows the management actions under the various alternatives as they would apply to specific allotments.

In the impact assessment for each alternative, short-term impacts are those that would occur during implementation of a management action, or within 2 years after its completion. Revegetation normally begins within 2 years and becomes well established in 5. Long-term impacts are those remaining after 2 years. Residual impacts are those that would remain after the year 2000.

The acreage calculations presented in this chapter consider public lands only.

ANALYSIS ASSUMPTIONS

General planning assumptions are contained in chapter 1. Assumptions for analysis of anticipated surface disturbance and reclamation for activities, by alternatives, are shown in table 54. Additional specific assumptions are contained in resource sections and specific appendixes.

The following assumptions were used in preparing the impact analysis.

- Existing laws and policies will remain in effect without substantial change during the analysis period. The RMP team is aware that laws, regulations, and agency policy often change, sometimes in response to litigation. However, for the purposes of this analysis, it is assumed that the current regulatory framework would remain constant.
- All management actions and designations will be adequately funded and staffed. All alternatives assessed are feasible and could be implemented within normal funding guidelines.
- No geothermal exploration or leases will occur during the analysis period (until the year 2000). Accordingly, impacts from this type of development are not assessed.
- Under management program 4133, only potash-related activities would occur in the planning area. It is further assumed that no exploration or production of potash would occur during the analysis period.
- The analysis for big game species assumes the species would be allowed to achieve maximum numbers possible for the crucial habitat involved.

IMPACT ASSESSMENT

The following section, arranged by alternative, analyzes each environmental component. None of the alternatives has the potential to affect threatened or endangered (T/E) fish species of the Colorado River drainages air quality or social conditions in local communities.

TABLE 54

Acres of Anticipated Surface Disturbance and Reclamation for Activities, by Alternative

Activity	Acres Disturbed, by Alternative					
	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Oil and Gas	600	660	600	120	600	600
-Reclaimed	370	420	370	80	370	370
-Not Reclaimed	230	240	230	40	230	230
Geophysical	1,440	1,800	1,440	360	1,440	1,440
-Reclaimed	960	1,200	960	240	960	960
-Not Reclaimed	480	600	480	120	480	480
Coal	48	48	32	16	48	48
-Reclaimed	40	40	27	13	40	40
-Not Reclaimed	8	8	5	3	8	8
Mineral Material	300	300	300	60	300	300
-Reclaimed	100	100	100	20	100	100
-Not Reclaimed	200	200	200	40	200	200
Locatable Minerals	240	360	180	180	180	240
-Reclaimed	150	230	110	110	110	150
-Not Reclaimed	90	130	70	70	70	90
Watershed	20	20	20	20	20	160
-Reclaimed	0	0	0	0	0	100
-Not Reclaimed	20	20	20	20	20	60
Livestock Grazing	120	480	0	0	120	120
-Reclaimed	40	150	0	0	40	40
-Not Reclaimed	80	330	0	0	80	80

(Continued)

TABLE 54 (Concluded)

Activity	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Recreation (ORV)	46,430	15,390	17,230	6,310	38,770	30,490
-Reclaimed	0	0	0	0	0	0
-Not Reclaimed	46,430	15,390	17,230	6,310	38,770	30,490
Rights-of-Way	120	120	120	12	120	120
-Reclaimed	60	60	60	5	60	60
-Not Reclaimed	60	60	60	7	60	60
Fire Management	156	156	156	156	156	156
-Reclaimed	80	80	80	80	80	80
-Not Reclaimed	76	76	76	76	76	76

NOTE: The following are examples of how acreages of surface disturbance were derived. It was assumed that 10 oil and gas wells per year would be drilled between 1988 and 2000, and that each well pad and associated access road would total about 5 acres (10 wells x 12 years x 5 acres = 600 acres disturbed). It was further assumed that 24 of the 120 wells would be productive (and would not be reclaimed) (24 wells x 5 acres = 120 acres not reclaimed); that the remaining 74 would be abandoned and reclaimed (74 wells x 5 acres = 370 acres to reclaim); and that reclamation would be successful, with site-specific seed mix of native and exotic grasses and shrubs within 5 years. There would be 20 wells in the process of being reclaimed (20 wells x 5 acres = 100 acres not reclaimed) and reclamation on 2 wells would not be successful (2 wells x 5 acres = 10 acres not reclaimed). The remaining 230 acres would not be reclaimed by 2000 because of area in production or reclamation not yet completed or not successfully reclaimed.

It was assumed that two water developments, one each in San Rafael Resource Area (SRRA) and Forest Planning Unit (FPU), and 2 miles of fence per year, 1 each in SRRA and FPU, would be constructed between year 1988 and 2000, and that each water site would disturb 3 acres and each fence would disturb 2 acres. Of the 120 acres disturbed, all fence disturbance would be reclaimed while 80 acres of water sites would remain unreclaimed by 2000.

Under Recreation, it was assumed that while disturbed areas are being reclaimed, additional acres would be disturbed.

ALTERNATIVE A

MINERAL COMPONENTS

Oil and Gas

The following category restrictions would continue to direct the leasing of oil and gas. Tar sand leasing categories are included in those for oil and gas.

Category 1, which imposes no special requirements on development, covers 1,130,280 acres in SRRA and 51,770 acres in FPU or 1,182,050 acres in the planning area.

Category 2 covers 43,130 acres in SRRA and 18,270 acres in FPU or 61,400 in the planning area. Category 2 includes special lease conditions, such as seasonal conditions on mule deer and elk winter range and surface use restrictions along streams or on slopes in excess of 50 percent. The high-potential areas are located in areas covered by categories 1 and 2. These restrictions increase the difficulty of planning exploration programs and maintaining production operation, thereby increasing industry's exploration and production costs. The other restrictions occur in areas that have low to moderate potential for new discoveries or do not have any present or past production; therefore, the restrictions would have little, if any, effect on production.

Category 3 covers 169,320 acres in SRRA and 5,310 acres in FPU or 174,630 acres in the planning area. Category 3 allows leasing with no surface occupancy, so these areas could be developed only by directional drilling from adjacent land, which would increase costs to industry.

Category 4, no leasing, covers 121,110 acres in SRRA and none in FPU. The areas covered by categories 3 and 4 have low to moderate potential for new oil and gas discoveries and no past or present production (appendix Q).

Lands in categories 3 and 4 include primitive areas, scenic corridors, the river corridor, airport lease, and recreation sites.

Although no wells are currently (1988) producing petroleum in the planning area, there are producing wells in Emery County, and it is assumed that future petroleum production in the planning area will occur. For analysis purposes, it was assumed that 2 of the 10 wells drilled each year would become producers, with production beginning the following year.

Producing wells are assumed to produce 600 barrels of petroleum and 30,000 MCF (thousand cubic feet) of natural gas per year. Production during the planning period (22 wells producing half of the time) is estimated to average 6,600 barrels of petroleum and 424,000 MCF of natural gas per year (94,000 MCF from existing wells and 330,000 from projected wells). It is assumed that annual production would increase to 13,200 barrels of petroleum and 754,000 MCF of natural gas by the year 2000.

Geophysical exploration would remain steady with 100 miles of seismic line being completed every year, which would be distributed throughout the planning area. Geophysical work would not be restricted, as access and methods of acquiring geophysical data would remain constant.

Conclusion

Neither the area open to leasing nor the area in any leasing category would change (category 1, 1,182,050 acres; category 2, 61,400 acres; category 3, 174,630 acres; and category 4, 121,110 acres).

Production would increase to 13,200 barrels of petroleum and 754,000 MCF of natural gas at year 2000. Geophysical exploration would remain constant at 100 miles per year by the year 2000.

Coal

Currently, 33,720 acres in SRRA and 28,570 acres in FPU (a total of 62,290 acres in the planning area) are available for coal exploration. However, because of no-surface-occupancy stipulations, coal drilling would be precluded and the total area available for exploration would be less than explained above. Most of these available lands are underlain by the Emery Coal Field (or Emery Known Recoverable Coal Resource Area (KRCRA)). This field and the Wasatch Plateau Coal Field (or Wasatch KRCRA) are the only parts of the planning area where coal resources are known to exist.

Fewer than 6,000 acres of public land overlie the Wasatch KRCRA; these lands are on the cliff edges of the Wasatch Plateau. The U.S. Forest Service (USFS) boundary and the cliff edge do not coincide but leave small, isolated parcels of public land on the cliff edge outside the national forest (NF) boundary.

Regulations governing coal exploration include special stipulations to protect unique resource values and require a detailed plan, total reclamation, and bonding.

Coal drilling is the only current feasible method of exploration. One cannot drill with a no-surface-occupancy stipulation; therefore, the effective amount of area available for exploration is 58,310 acres (32,440 in SRRA and 25,870 in FPU). This is the baseline quantity that shows in alternative A in table 11.

Under alternative A, all coal exploration in the Wasatch KRCRA would occur on USFS lands. Some exploration would be conducted in the Emery KRCRA by the year 2000. The Highway I-70 Scenic Corridor would exclude from surface occupancy 1,280 acres in SRRA and 2,700 acres in FPU, effectively removing this land from coal exploration. Coal drilling was not addressed in the MFP; therefore, the no-surface-occupancy requirement is new.

Drilling and geophysical listening methods are currently the only feasible methods of exploring for coal away from known outcrops. No coal quantity or quality information would be available for this area. This lack of information could hamper future underground mining operations in the I-70 corridor. However, no mining is anticipated from the I-70 corridor area by the year 2000.

The large unused capacity from existing mines on the Wasatch KRCRA and the one operation on the Emery KRCRA, where coal quality is superior, would satisfy the demand for coal. Therefore, the no-surface-occupancy requirement for the I-70 corridor is expected to result only in the loss of 3,980 total acres to coal exploration in the Emery KRCRA. This may reduce the number of coal drill holes by one per year. A total of 32,440 acres in SRRA and 25,870 acres in FPU would be available for exploration under standard conditions, 91 percent being within the Emery KRCRA.

Federal coal production from the one operation in the Emery KRCRA has been sporadic in recent years, averaging roughly 150,000 tons per year. The Emery Mine operates on a permit area of 5,180 acres, of which only 880 acres are federal leases; the remainder cover private and state coal. This mine has reserves for 15 to 20 years based on current production. With the tight coal market and the estimated 5 to 10 years to lease and permit a new mine, all production from the Emery KRCRA is expected to come from the Emery Mine (Consolidation Coal Company) until well after the year 2000.

The unsuitability study (appendix F) identified 3,940 acres of the Wasatch KRCRA as unsuitable for any mining or leasing because of municipal watershed areas and 160 acres of Emery KRCRA unsuitable for any mining or leasing because of public land in a municipality (the town of Emery). Both these areas (4,100 acres) are in SRRA.

There would be no impacts from identification of 3,940 acres as unsuitable for leasing due to municipal watersheds. These acres are on the Wasatch Plateau just outside the NF boundary on the cliff edges. A total of 3,800 acres are already under existing leases with stipulations to protect water quality and can be mined by underground methods only. Surface facilities would not be built in these areas. The existing mining operations would not affect water quality to municipal watersheds.

The 160-acre area determined unsuitable for coal leasing due to its inclusion in the town of Emery lies on the extreme northwest corner of the Emery KRCRA, where coal quality and quantity are suspect. Also, the large Joes Valley fault system runs adjacent to this 160 acres and makes mining impossible under current technologies and economics. Therefore, the unsuitability finding would have no effect on coal production.

A total of 58,190 acres (29,620 in SRRA and 28,570 in FPU), all within the two KRCRAs, are available for coal leasing.

A total of 3,980 acres of the lands available for leasing (1,280 in SRRA and 2,700 in FPU) have a no-surface-occupancy requirement. This would have no impact on leasing, since underground mining plans that protect the surface from subsidence damage would be approved and surface facilities for the mine would be placed outside the I-70 corridor. Future mining, therefore, could still take place under the corridor. Since no production is anticipated from unleased areas by the year 2000, there would be no impact to coal production.

Conclusion

Areas available for coal exploration would be reduced by 3,980 acres from the KRCRAs due to the I-70 Scenic Corridor no-surface-occupancy requirement. A total of 58,310 acres would be available for coal exploration, of which 58,190 acres would be available for leasing. Since no coal production is anticipated from unleased areas, current coal production (150,000 tons per year) would continue.

Mineral Materials

The entire SRRA (1,463,840 acres) would be available for mineral material disposal, as would the entire FPU (75,350 acres, for a total in the planning area of 1,539,190 acres), unless disposal is precluded by site-specific conditions such as mining claims or an archaeological site.

The 1987 production of 164,000 cubic yards of mineral materials (sand and gravel) shows a steady increase from 83,000 cubic yards in 1986, 23,000 in 1985, and 11,000 in 1984. No new roads are being built, but existing roads are being maintained or upgraded. Highway I-70 is expected to be completed with the addition of two more lanes by 1990. Projected use appears to be increasing and is expected to average 210,000 cubic yards per year for SRRA, but FPU is not expected to have any production as most of I-70 is completed in that planning unit. By the year 2000, mineral material production in SRRA could increase to 320,000 cubic yards per year.

Conclusion

The area available for disposal of mineral materials under alternative A would total 1,539,190 acres. Production would increase to 320,000 cubic yards per year by the year 2000.

Locatable Minerals

The majority of SRRA (1,462,060 acres) is open to entry, as is the entire FPU (75,350 acres), for a total of 1,537,410 acres in the planning area. In SRRA, 1,780 acres would be withdrawn from entry under alternative A. The withdrawn area has moderate to no potential for uranium. For gypsum, 720 acres of the area withdrawn from entry has high to moderate potential; the remainder, low to no potential (appendix Q). Certain lands actions can close areas to entry, but these cannot be predicted with any certainty.

Currently (1988), there is no production of any locatable minerals in SRRA or FPU, and no production is expected by the year 2000. Several thousand mining claims have been located for uranium and gypsum in SRRA and a few for uranium in FPU. No gypsum has been produced; the uranium market is currently (1988) depressed and is not expected to change by the year 2000. Since 1983, one uranium mine has produced for less than 3 months. Since no further production is expected until after the year 2000, no impact to production is projected. Locatable mineral activity is expected to be confined to assessment work in areas of high potential for uranium and high to moderate potential for gypsum.

Under alternative A, standard conditions would be applied to 1,412,610 acres in SRRA and 75,350 acres in FPU, for a total of 1,487,960 acres in the planning area. To protect the I-70 Scenic Corridor Area of Critical Environmental Concern (ACEC), special conditions would be applied to 49,450 acres in SRRA. Compliance with special conditions would be required to the extent possible without curtailing the operators' rights. Filing plans of operation and complying with the special conditions would increase the operators' costs, which could result in an unquantified decrease in exploration and development work in those areas to which special conditions apply.

Present management has little effect on mining claim location, but various actions under alternative A could affect the acreage open to entry. If 6,820 acres identified for land disposal are sold, this would reduce the area open for mineral entry. Although minerals are generally reserved to the Federal Government during land disposals, there are presently no regulations to provide for location of mining claims on such areas.

Areas designated for disposal of mineral materials have priority over extraction of locatable minerals, but there is no known conflict in the area.

A total of 1,780 acres under R&PP leases are withdrawn from mineral entry. Any new such grants or leases would remove additional lands from the area open to entry, but the loss of acreage cannot be quantified because applications cannot be predicted with any certainty; however, the potential loss would not be significant.

A total of 7,890 acres under public water reserves (PWRs) are withdrawn from the location of nonmetalliferous locatable minerals only. This partial closure is not significant, as the areas are still open to location of metalliferous locatable minerals.

Conclusion

The area available for location of mining claims under alternative A would total 1,537,410 acres.

BIOTIC COMPONENTS

Soils

Impacts to soils are often secondary to surface-disturbing activities or grazing and are in addition to the base rate. Soil loss reflects actual loss through erosion. A ton of soil loss per acre is equivalent to 27 cubic feet of material being removed from an area 66 by 660 feet (1 acre, approximately the size of 1.25 football fields). However, the soil loss in tons per acre is not equally distributed in all parts of the planning area. The resulting sediment and salt yields cause tertiary impacts to water quality and are discussed separately.

Soil loss and sediment yield estimates were based on a sedimentation study on small reservoirs in the San Rafael Swell [King and Mace, 1953] except for estimates on disturbed lands. Analysis of impacts from specific activities causing surface disturbance were based on King and Mace [1953], Dissmeyer [1981], Schumm and Gregory [1987], and Lusby, et al., 1971]. Badger Wash is an ecosystem similar to that of a large part of the planning area. The range of values was determined as discussed in appendix N.

With continuation of present management, the base rate of soil loss should remain constant at between 7,135,590 and 60,414,590 tons per year (averaging 33,775,060 tons per year). These values include soil loss due to surface-disturbing activities (see table 54) (between 3,345,590 and 27,914,550 tons per year) as well as natural geologic erosion (between 3,790,000 and 32,500,000 tons per year) including wind erosion.

In addition to the reasons stated for this range of values, other factors, such as variations in climate, can affect soil loss and sediment yield variability. During any one year, precipitation events could occur as short-duration, high-intensity localized storms which could cause a large and rapid amount of soil movement due to overland flow. These types of storms often cause flash floods, which transport a great deal of soil from ephemeral and perennial channels. Precipitation events in the form of long-duration, low-intensity storms could also occur. These types of storms often allow time for moisture to infiltrate into the soil, rather than run off, and therefore transport little or no soil. The quantity of snow and timing of snowmelt is also a factor in this range of values. Other factors include, but are not limited to, slope, slope length, aspect, localized variation in soil characteristics, depth to bedrock, compaction, porosity, quantity and quality of vegetation, and soil surface factors such as rocks, litter, soil crust, soil structure and cryptogamic cover.

ORVs are estimated to contribute between 427,300 and 3,232,500 tons of soil loss per year. These values are calculated only from vegetation losses and may actually be much higher due to, but not limited by, some of the following causes discussed by Webb and Wellshire [1983].

1. ORVs often establish a major network of rills and gullies which concentrate and channel runoff increasing erosion on and off site. Soil is often lost in these newly created and unvegetated channels.
2. On steep slopes, ORVs make deep grooves which are then deepened by runoff energies, thus transporting more soil particles. Erosion becomes more severe if the slopes exceed 20 percent, but slope does not limit the machines until it exceeds 40 percent.
3. ORVs can compact and disrupt the soil surface which (1) reduces the infiltration capacity, causing more water to run off and allowing more soil transport; (2) reduces the soil's capability

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to absorb water, leaving less water available to the plants; (3) allows more soil particles to be available for transport by disrupting the soil's crust; and (4) results in a loss of plant cover, which opens areas to wind erosion onsite and offsite. Soil particles, particularly sands, can spread downwind, burying and killing vegetation that was not directly damaged by ORVs.

Therefore, continuing to leave the entire planning area open to ORV use would allow a continued decrease in soil productivity, as ORV use disturbs soils, destroys vegetation, and accelerates soil erosion. This soil deterioration would be most significant in those areas receiving the greatest amount of ORV use, such as Buckhorn, along the San Rafael Reef from Goblin Valley to Temple Mountain, Tomsich Butte, Swasey Cabin, and the Head of Sinbad. With an increase of up to 30 percent in recreational activity and ORV use over the life of the plan, there would be a corresponding increase in soil loss of 128,200 to 969,900 tons per year by the year 2000.

Livestock grazing is estimated to contribute 2,935,000 to 24,820,000 tons per year of soil loss. Ungrazed watersheds average 30 percent less runoff and 45 percent less sediment than do grazed watersheds during periods of similar rainfall [Lusby, 1970].

While soil losses were estimated from actual acres grazed, they were not estimated for different grazing practices. Reductions in soil loss and sediment yield could result from changes in livestock management techniques, such as range improvements to alter livestock distribution or changes in season of use. These could alter plant vigor, density, canopy and ground cover, and species composition. The effects of these vegetation changes could not be quantified or converted to soil losses.

Surface-disturbing activities associated with livestock-related range improvements are estimated to contribute between 750 and 5,500 tons per year.

Geophysical activities may contribute between 6,480 and 49,700 tons of soil loss per year. Coal development may contribute between 70 and 550 tons per year. Mineral material activities may contribute between 1,850 and 14,000 tons per year, and mining claim assessment and development, between 750 and 6,300 tons per year. These surface-disturbing activities could decrease short-term soil productivity through soil compaction, erosion, vegetation loss, reduced soil moisture capabilities, and mixing of the soil horizon. Accidental fluid discharges during oil and gas drilling operations could contaminate soils.

Impacts from rights-of-way would be similar to those from mineral activities. Rights-of-way may contribute between 470 and 3,500 tons per year.

Estimates of soil loss are based on the amount of public land in the planning area. Disposal of public lands results in less BLM acreage available to contribute to total soil loss. With land disposals under alternative A, between 26,830 and 216,500 fewer tons of soil may be contributed from public lands.

Other activities would have a negligible impact to soils, although specific projects could have a substantial local impact. These cannot be predicted.

Conclusion

The base rate of soil loss should remain constant at between 7,135,590 and 60,414,550 tons per year. Soil loss could increase, however, by between 7,263,740 and 61,384,300 tons per year due to increased disturbance from ORVs by the year 2000. This would include an increase of 128,200 to 969,900 tons per year.

Water

Impacts to water can be measured by change to the quality of surface and ground water. Surface water quality is generally a tertiary impact governed by soil loss resulting from surface disturbance. Surface water quality is also affected by geologic conditions, such as natural erosion or salts leaching directly out of rock formations. This baseline rate has been estimated and is reflected in this analysis.

Increased soil loss results in increased sediment yields, which degrade water quality. A fixed percentage of salt is associated with sediment; therefore, an increase in sediment yield has a corresponding increase in salt loading.

Sediment yields and salt loading are given in reference to the Colorado River. The intent is not to give annual concentrations of suspended sediment and salt in the Colorado River, but rather to indicate how much sediment and salt would be delivered to the Colorado River through various management programs and change agents.

Sediment and salt yields were estimated based on King and Mace [1953], Schumm and Gregory [1987], and Lusby, et al. [1971].

The base rate of soil loss should remain constant at between 7,135,590 and 60,414,550 tons per year, for an average of 33,775,070 tons per year (see Soils). The corresponding sediment yield should remain constant at between 2,854,230 and 24,165,810 tons per year (averaging 13,510,020 tons per year). Shumm and Gregory [1987] found that salt production is closely related to sediment concentrations. That relationship is used throughout this analysis (see Soils). Salt yield should remain constant at between 28,625 and 424,404 tons per year (averaging 226,515 tons per year). These values include sediment (between 1,338,230 and 11,165,810 tons per year) and salt yields (between 14,255 and 195,200 tons per year) due to surface-disturbing activities as well as natural geologic erosion (sediment, between 1,516,000 and 13,000,000 tons per year; salt, between 14,370 and 229,200 tons per year). This range of values is described in appendix N. Other factors that could contribute to this wide range of values were discussed in this alternative under Soils.

Rates of salt and sediment yields correspond to a 1987 total dissolved solids (TDS) level of 600 milligrams per liter, as evaluated at Imperial Dam in southern Arizona. Several unusually wet years preceding 1987 caused the salt concentration to be diluted by higher flow levels; drier years would result in a higher TDS level.

ORVs are estimated to contribute between 170,900 and 1,293,000 tons per year of sediment and between 2,820 and 21,710 tons per year of salt to the drainage systems. These values are based on vegetation losses only. The actual values may be higher due to factors described under Soils in this alternative and some of the following factors discussed by Webb and Wellshire [1983:

1. The quality of water at an ORV site is reduced by the increased runoff that results from the removal of vegetation cover and soil compaction. ORV tracks become partly sealed to infiltration and act as channels for overland flow, again increasing runoff.
2. Increased runoff and decreased plant cover can cause an increase in the frequency and magnitude of flooding.
3. Much of the soil that is eroded from the land by ORV use ultimately enters surface waters, where it contributes to the sediment and salt load and accelerates siltation of the streams.
4. ORV users can add biological and chemical contaminants to the soils, and hence to the surface or ground water, with small quantities of gas or oil spilled or leaked from their machines.

Therefore, continuing to leave the entire planning area open to ORV use could allow a continued increase in sediment and salt yield because of increased surface disturbance (destruction of vegetation, soil compaction, disruption of the soil surface, destruction of surface stabilizers, reduction of infiltration capacity, increased frequency and intensity of runoff, and concentration and channeling of runoff) caused by ORVs. The effects are greatest in those areas of saline soils receiving heavy use. With an increase of up to 30 percent in recreational activity and ORV use, there would be a corresponding increase of between 51,270 and 387,900 tons per year of sediment and between 845 and 6,513 tons per year of salt by the year 2000.

Livestock grazing could contribute between 1,173,900 and 9,927,600 tons per year of sediment and between 11,500 and 174,700 tons per year of salt. Surface disturbance associated with livestock-related range projects could increase sediment between 300 and 2,200 tons per year and increase salt yields between 5 and 38 tons per year.

Geophysical activity and oil and gas development could affect surface and ground water. Construction of roads and drill pads could increase sediment and salinity yields in local surface water. Geophysical activity could add between 2,600 and 19,880 tons of sediment and between 33 and 192 tons of salt per year to drainage systems. Unplugged or improperly plugged holes can cause aquifers to interact, which could result in low water levels. Blasting can alter aquifer characteristics, affecting existing wells. Although impacts normally occur only from shots closer than 500 feet, a safe working distance must be determined on a case-by-case basis. With adherence to standard operating procedures, ground water should not be degraded.

Coal leasing and development could result in increased sediment and salt yields from roads, mine facilities and associated surface-disturbing activities. Coal leasing could result in an increase of sediment of between 30 and 220 tons per year and an increase in salt by as much as 2 tons per year.

Minerals exploration and development may cause an increase in sediment and salt yield. Road construction and other mine-related disturbances could increase sediment and salt loads in local surface waters. It is estimated that sediment may increase by between 740 and 5,600 tons per year and salt by between 9 and 54 tons per year due to removal of mineral materials. Sediment may increase by between 300 and 2,520 tons per year and salt by between 4 and 24 tons per year due to assessment work on mining claims.

Mineral material operations in close proximity to perennial watercourses could destabilize and alter natural stream channels and disrupt the beneficial values of floodplains. These impacts could change the water table and surface water flows and could make floods more destructive.

Ground water can be affected directly or indirectly by development. Minerals development could contaminate ground water in the planning area.

Rights-of-way could increase sediment by between 190 and 1,400 tons per year and salt yield by between 2 and 14 tons per year. The presence of roads in an area may increase sediment yield and subsequent salt yield because sediment is produced from the road surfaces and because erosion could increase where the roads concentrate runoff. Proper design and maintenance can minimize increased yields. Increased use of existing roads can slightly increase existing sediment yield by increased disturbance of the road surface.

The estimates of sediment and salt yield are based on the amount of public land in the planning area. Disposal of public land results in less BLM acreage available to contribute to total sediment and salt yield. With land disposals identified under alternative A, between 10,730 and 86,610 fewer tons of sediment and between 118 and 1,530 fewer tons of salt per year may be transported from public lands in the planning area.

Fire management in SRRA is limited. Historically, fires have been small and infrequent, and the effects from fire on water resources are negligible. Site-specific information would be necessary to predict or quantify the exact effects. The impacts from fire management, therefore, will not be discussed further.

Hazardous waste management is a potentially critical contaminant of water. Since standard operating procedures are meant to prevent any problems, water quality degradation would be limited to accidents and inadequate enforcement. These cannot be predicted, and this type of impact has not been assessed.

Conclusion

Surface water quality could continue to degrade due to the continued input of sediment and salt. Sediment base yield rate of between 2,854,230 and 24,165,810 tons per year (averaging 13,510,020 tons per year) could increase to between 2,905,500 and 24,553,710 tons per year (averaging 13,729,605 tons per year) due to increased disturbance from ORVs by the year 2000. This would include an increase of between 29,470 and 403,920 tons per year. Salt base yield rate of between 28,625 and 424,404 tons per year (averaging 230,194 tons per year) could increase to between 29,470 and 430,917 tons per year due to increased disturbance by ORVs by the year 2000. This would include an increase of 845 to 6,513 tons per year. Ground water quality would remain constant. The existing level of TDS, in milligrams per liter, is unquantified.

Air

Current (1988) air quality in the planning area is good. The entire planning area is in attainment with national ambient air quality standards (NAAQS) and is protected by prevention of significant deterioration (PSD) air quality regulations. Four special-interest areas, Sids Mountain, Mexican Mountain, San Rafael Reef, and the lower Green River, have been identified as having air quality values that are important attributes to those areas. Protection of these air quality values will require special management attention if and when the special interest areas are developed. This special management attention would occur during a PSD review of any major polluting activity that would influence visibility in the special interest areas. Any needed protection could be provided using best available control technology.

An impact area has been designated around Hunter Powerplant Unit 3, and polluting activities are controlled within this area by the relatively stringent class II PSD allowable increment limitations. Impacts within this area will be assessed on a case-by-case basis through the State of Utah's permitting process.

Under alternative A, polluting activities would continue and possibly expand; however, no new large industrial or mineral extraction activities are expected through the year 2000. Temporary (less than 6 months) degradation of air quality could occur from individual projects.

Visibility and air quality in nearby class I areas are vulnerable to impacts. Surface-disturbing activities and secondary impacts, such as an increase in the number of people present, could cause significant impacts, particularly to the Capitol Reef National Park (NP) class I area. Protection provided these class I areas could constrain BLM management options for activities occurring in class II lands, if they occur close to the class I area. The extent of such constraints must also be determined on a case-by-case basis.

Conclusion

Under alternative A, air quality in the planning area would remain good until the year 2000.

Vegetation

Vegetation resources affected by BLM management include (1) the general vegetation cover that would be removed by surface-disturbing activities or development, and (2) forage removal. Changes to livestock forage are discussed under Human Uses, Grazing. Forest products use, T/E plants, and riparian and aquatic habitats are discussed in other sections.

Change in vegetation cover is usually a short-term impact. When a site is reclaimed, the vegetation is regained, although species composition may be different.

Under current management, short-term loss of vegetation would occur on 47,474 acres, long-term loss on 7,070 acres, for a total area of 54,544 acres where vegetation would be disturbed, an increase of 16,064 acres over the current situation. Disturbance would be short-term on approximately 8,994 of these acres. (Short-term disturbance on about 46,180 acres would result from ORV use, but the majority of this loss would be recovered through natural succession.) The long-term loss of vegetation would result from land disposals (6,820 acres) and the proposed Green River Scenic Loop (250 acres). General analysis assumptions are explained in appendix S. Acres of expected disturbance are listed by activity in table 54.

Anticipated changes in ecological condition under alternative A are shown in table 55. Changes to lower seral stages would result from the lack of allotment management plans (AMPs) or intensive grazing management under which rest could be provided for livestock forage species during the grazing season. The lack of periodic rest would decrease plant vigor and density and change plant composition, thus reducing the acres in the later seral stages.

TABLE 55

Anticipated Changes in Ecological Condition, Alternative A

	Ecological Condition by Percent of Resource Area	
Ecological Condition Class	Present (1985)	Future (2000)
Potential Natural Community	9	8
Late Seral	22	20
Mid Seral	47	46
Early Seral	9	13
Rock Outcrop/Badlands	13	13

The Bowknot Bend (1,830 acres), North Big Flat Top (190 acres), Hebes Mountain (690 acres), and San Rafael Reef (43,870 acres) relict vegetation areas would not be designated as ACECs under alternative A. Therefore, these isolated areas would not receive special protection.

Threatened or Endangered Plants

There would be no impact to T/E species from controlled activities. T/E plants could be damaged by the uncontrolled use of ORVs and by mining activities that disturb fewer than 5 acres. The T/E plant habitat would be monitored, and management would be implemented to prevent any impacts on the plants.

Conclusion

Vegetation would be lost on approximately 54,544 acres (47,474 acres of short-term loss, 7,070 acres of long-term loss). Changes to lower seral stages would result. Relict vegetation areas would not be protected under alternative A. Less than 1 percent of the area is affected by forest products. There would be no adverse impacts to T/E plants.

Wild Horses and Burros

Under alternative A, 475,680 acres are used by wild horses and burros. The current estimated number of wild horses is 114 head. Wild burros are estimated to be 70 head. No forage was allocated to wild horses or burros during the adjudication period. Under this alternative, wild horse numbers would be managed within the range of 200 to 235 head and wild burros between 70 and 100 head. At the upper limits, wild horses would require 2,115 animal unit months (AUMs) and wild burros 720 AUMs, for a total of 2,835 AUMs.

Conflicts between wild equids and livestock may be resolved and adjustments in specific forage use levels would be made at the activity plan level, in conjunction with grazing decisions, or at any time deemed necessary as a result of rangeland monitoring.

Conclusion

The wild horse and burro range includes 475,680 acres of public land. Wild horse numbers would be maintained beween 200 and 235 head and wild burros between 70 and 100 head. At the upper limits, 2,835 AUMs would be required for these animals. Forage use levels may be adjusted for wild equids and livestock when monitoring information is available. When wild equid numbers reach the upper limit, they would be reduced to the lower limit; animals would be made as often as necessary.

Wildlife

Impacts to wildlife species are analyzed as the area of crucial habitat available and the effect on wildlife numbers.

Desert Bighorn Sheep

Because surface disturbance would be reclaimed and herds could expand into available areas, the amount of crucial bighorn sheep habitat would grow from 109,600 acres to about 150,000 acres under alternative A. However, the desert bighorn sheep population would not reach its full potential, primarily because of the following factors.

- Continuation of livestock grazing at current levels and seasons of use would not allow the desert bighorn sheep population to expand at more than 9 percent per year for two reasons: because livestock are using range that desert bighorn sheep would require to continue their present level of population increase, and because desert bighorn sheep can acquire diseases from livestock.

- Without special or seasonal conditions, ORV use and development activities, especially if occurring in crucial habitat areas, would cause stress to the animals or direct loss of forage.

- Oil and gas development, mineral material development and disposal activities, and mineral entry could affect 192 acres; assuming that 100 acres will support one desert bighorn sheep, two sheep would be lost.

- An undetermined degree of conflict between desert bighorn sheep and wild burros exists at present on at least 150 acres of crucial habitat; if either population should increase, the conflict would increase proportionately.

Assuming a continuation of the natural growth rate of 18 percent per year, the desert bighorn sheep population has the potential to grow from about 225 to over 500 in the sixth year of the plan and to 1,390 by the year 2000. However, because of the reasons stated above, desert bighorn sheep would increase to about 500 under alternative A.

Antelope

Even though all but 340 acres of potential disturbance would be reclaimed, antelope habitat would decrease from 507,340 to about 507,000 acres under alternative A. The antelope population would not reach its full potential on the remaining habitat, primarly because of the following factors.

- Antelope would continue to compete for water, although existing wildlife waters would be maintained and five more water facilities would be constructed in antelope habitat.
- Maintaining livestock grazing at current levels and seasons of use would result in continued competition for spring grasses and forbs and reduce the potential for antelope populations to increase.
- Development activities and ORV use without special or seasonal conditions could cause the direct loss of 100 animals or could displace antelope from at least 340 acres of habitat (340 acres is thought to be a conservative estimate).

Assuming a natural growth rate of 10 percent per year, the pronghorn antelope population has the potential to grow from about 600 to 1,200 animals by the year 2000. The population is increasing at present and probably would maintain a modest increase. However, under alternative A, pronghorn antelope would increase by 100 animals to about 700 animals by the year 2000 because of the reasons stated above.

Mule Deer and Elk

Crucial habitat areas for deer and elk would not change under alternative A (35,510 acres for deer and 18,200 acres for elk). These crucial habitats partially overlap. The mule deer and elk use of crucial habitat would remain at less than full potential, primarily because of the following factors.

- The activities associated with harvesting of woodland products on the 35,500 acres of crucial deer winter range and the 18,200 acres of crucial elk winter range would continue to impact mule deer and elk during the winter, stressing the animals and causing them to avoid areas of active wood harvest; however, the removal of pinyon and juniper trees also has the potential to release desirable vegetation for utilization by deer and elk.
- Continuation of livestock grazing at current levels and seasons of use would not allow the mule deer and elk populations to expand more than 10 percent per year.
- Without special or seasonal conditions, ORV use, especially if occurring in crucial habitat areas, would stress the animals or cause direct loss of forage.

Assuming a natural growth rate of 5 percent per year, the mule deer population has the potential to grow from about 6,100 to about 9,200 animals (prior stable numbers; a 62 percent increase) by the year 2000. The elk population has the potential to grow from about 550 to about 800 animals. However, under alternative A, deer and elk would increase to only about 6,620 and 600, respectively.

Riparian and Aquatic Habitat

The riparian and aquatic habitat area affects many wildlife species, including T/E species (bald eagle, peregrine falcon, and certain fish). While new riparian areas would not be created, existing areas would increase in vigor and size (by 10 acres), and the density of riparian vegetation would also increase. Under alternative A, there would be 11,430 acres of riparian and aquatic habitat in SRRA and 3,350 acres in FPU for a total of 14,780 acres in the planning area.

Threatened or Endangered Animals

Any loss of cottonwood trees in the riparian habitat of the Green River would be detrimental to the wintering bald eagle. Cutting or other destruction of these trees is prohibited. Therefore, there would be no impact to the eagle under this alternative.

The peregrine falcon nest would be protected from development activities under alternative A with monitoring and restriction of activity to prevent impacts from uncontrolled activities such as recreation use and mining claim work on fewer than 5 acres.

Nest sites of ferruginous hawks are not mapped and change from year to year. The nests are protected from controlled activities. Nest sites would be monitored, and mitigation measures would be applied to prevent impacts from uncontrolled activities such as recreation use and mining claim work.

The planning area contains numerous prairie dog towns that are potential habitat for black-footed ferrets. For any proposed action that could affect the prairie dog towns, approval would not be granted without evaluation to determine whether ferrets are actually present.

Conclusion

Crucial habitat for desert bighorn sheep would increase to 150,510 acres from 109,600 acres, allowing a population increase from about 225 animals to 500 by the year 2000.

Habitat for pronghorn antelope would be reduced to 507,000 acres, a loss of 340 acres from the existing situation. Despite the loss of crucial habitat, antelope populations would increase from about 600 animals to about 700 animals.

Mule deer and elk crucial habitat would remain constant at 35,510 acres for mule deer and 18,200 acres for elk; their populations would increase from about 6,100 mule deer and 550 elk to about 6,620 deer and 600 elk.

Riparian and aquatic habitat and related T/E wildlife species habitat would increase to 14,780 acres. There would be no adverse impacts to T/E species.

HUMAN USES

Grazing

Under alternative A, 1,421,880 acres in SRRA would be available for grazing in 91 allotments. Four isolated allotments have been identified for disposal, and it is assumed that these tracts would be disposed of by the year 2000. An additional 190,240 acres would be available for grazing in FPU (6 allotments administered by Sevier River Resource Area). The total area available for grazing under alternative A would be 1,612,120 acres. Areas closed to livestock grazing would include the Wildlife Allotment (630 acres), Buckhorn Draw (4,520 acres), and unallotted lands (1,730 acres).

Currently, livestock grazing occurs at approximately the level of the past 5-year average licensed use (56,871 AUMs); operator demand is less than allowable active preference (88,252 AUMs). It is assumed that operator demand for livestock forage will remain at current levels, but it may increase to allowable active preference. Therefore, a range of AUMs is used in this analysis.

Livestock grazing could continue at somewhat less than the past 5-year average licensed use, or it could increase to somewhat less than active preference because of decreases in available forage in some areas. Such a decrease would result primarily from land disposals (325 AUMs) and ORV disturbance (300 AUMs). An additional loss of 85 AUMs would result from oil and gas production, seismic exploration, mineral material sites, mining operations, wildfires, rights-of-way, and the Green River Scenic Loop. Such a loss is insignificant for analysis purposes in alternatives A through F, because the affected areas are scattered throughout the grazing area and are not concentrated in any specific area or allotment (appendix I). Also, the majority of this loss would be regained following reclamation. The long-term loss of livestock forage would result from land disposals. Surface disturbance from ORVs results in a short-term vegetation loss, most of which would eventually be restored.

The overall net change would be a 710-AUM decrease from the past 5-year average licensed use to 56,161 AUMs and from active preference to 87,542 AUMs. Licensed use would be within that range (between 56,161 and 87,542 AUMs), depending on operator demand. Analysis assumptions for determining changes in AUMs were given at the beginning of this chapter and in appendix T. Existing grazing management practices would continue with current stocking levels, seasons of use, and grazing systems. Grazing during the critical spring growth period without periodic rest would continue on 77 allotments. Six existing AMPs would remain implemented.

Conclusion

The public land area available for grazing would decrease from 1,618,940 to 1,612,120 acres.

The past 5-year average licensed use would decrease from 56,871 to 56,161 AUMs; active preference would decrease from 88,252 to 87,542 AUMs. Licensed use would be between 56,161 and 87,542 AUMs, depending on operator demand.

Forest Product Use

About 451,270 acres in the planning area are forested (414,950 acres in SRRA and 36,320 in FPU). Both dead and live wood exist on the same acreage. Under current management, normal harvest has not exceeded 130 cords per year and has occurred on less than 1 percent of the forested area each year. Historically, fires in the planning area have been so small and infrequent that their impacts are minimal. Therefore, the impacts from fire were not considered.

Impacts to forest resources are measured in terms of forest acreage removed from harvest, either by actually removing vegetation through surface disturbance or by restrictive conditions that would prevent harvest. Of the 451,270 forested acres, all but 490 acres of the forested area is available for campfire use, while 435,660 acres are available for designation for private and commercial forest product harvest (430,890 acres under standard conditions, and 4,770 acres under special conditions).

Since forest resources are renewable, impacts would not affect the overall resource value by the year 2000.

Conclusion

Based on past use and present harvest, an adequate supply of dead and live forest products would be available on 430,890 acres through the year 2000.

Cultural Resources

Impacts to cultural resources are often inadvertent, but much of the time they are intentional and illegal activities such as vandalism, illegal excavation, and artifact collecting. Site trampling, caused by animals, humans, or vehicles, is an inadvertent effect that results in soil loss, artifact relocation, and breakage or changes to the physical context of a site. Even in areas where projected impacts are mitigated through standard operating procedures, inadvertent impacts can result from human error or the failure of an inventory to locate buried sites not visible on the surface. Under alternative A, it is assumed that 6,735 cultural resources of the estimated 70,000 would be damaged or destroyed (appendix U). These impacts would be residual and not mitigated by standard operating procedures.

It is estimated that 989 cultural resource sites would be discovered within the 12-year planning horizon. Therefore, 2,489 sites would be available for uses such as scientific study, education and recreation opportunities, and conservation of sites for future generations.

Conclusion

About 6,735 cultural resource sites would be damaged or destroyed under alternative A, and about 2,489 sites would be available for use.

Recreation

The planning area is expected to experience substantial increases (up to 30 percent) in demand for motorized and nonmotorized recreation activities such as hiking, camping, sightseeing, ORV exploration, horsepacking, and river running.

Under current management, the recreation opportunity spectrum (ROS) classes would change significantly, continuing to shift from the resource-dependent end of the spectrum (primitive) to the facility-dependent end (rural and urban). Uncontrolled ORV use and development activities would cause extensive landscape changes, some of which would be irreversible.

The primitive (P) class would decrease by 48,040 acres (from 117,720 to 69,680 acres). The changes in P class and actions under other settings would decrease the semiprimitive nonmotorized (SPNM) class by 58,980 acres (from 242,390 to 183,410 acres) and decrease the semiprimitive motorized (SPM) class by 78,430 acres (from 741,300 to 662,870 acres). The roaded natural (RN) class would increase by 172,460 acres (from 434,260 to 606,720 acres), and the rural (R) class would increase by 7,190 acres (from 3,480 to 10,670 acres). The urban (U) class would decrease by 20 acres (from 40 to 20 acres).

Losses to the P and SPNM classes would be attributable mainly to geophysical and mining activities, range improvements, road construction, and the creation of additional informal vehicle routes from ORV use in the San Rafael Swell and Labyrinth Canyon Special Recreation Management Areas (SRMAs). With the loss of P class and increased demand for this setting, management actions to limit visitor use would probably be required to maintain the primitive social setting. Some users would be displaced to locations outside SRRA due to the use restrictions and loss of primitive recreation opportunities.

Commercial outfitters rely heavily on the P and SPNM settings. Visitor days associated with commercially guided river trips and horsepacking or sightseeing tours would be negatively affected by the reduction of scenic values and opportunities for isolated recreation experiences.

A slight increase in wildlife numbers under this alternative would increase wildlife viewing and hunting opportunities, resulting in a beneficial secondary impact to recreation.

All of the planning area (1,539,190 acres) would continue to be managed as open to ORV use. It is projected that the 662,870 acres of SPM class and the 606,720 acres of RN class would accommodate the increased motorized recreation use; however, conflicts between motorized and nonmotorized uses would continue to increase. Development activities within the P, SPNM, and SPM areas could benefit ORV recreationists by making these areas more accessible; however, the shift toward the facility-dependent end of the spectrum could adversely affect the quality of ORV experience.

Developed recreation sites would not be able to meet the demands brought on by the large increase in visitation. Dispersed camping use would increase, with existing and additional undeveloped campsites experiencing surface disturbance and trash and human waste problems.

Conflicts between livestock use and recreation would continue to increase. Livestock use would continue to reduce the quality of recreation experiences due to trampling and depletion of vegetation and deposition of fecal material.

Unusual recreation opportunities and scenic values identified in the wild and scenic rivers eligibility and potential classification study for the San Rafael River, Labyrinth Canyon (Green River), and Muddy Creek (appendix J) could be reduced with resource development in or adjacent to the canyons.

Conclusion

The overall effects of alternative A would be (1) a continued decline in opportunities for recreation associated with undeveloped settings, and (2) an increase in opportunities for recreation related to more developed types of settings. Additional roads and informal vehicle routes would be the primary type of development. The P class would decrease by 48,040 acres to 69,680 acres; the SPNM class would decrease by 58,980 acres to 183,410 acres; the SPM class would decrease by 78,430 acres to 662,870 acres; the RN class would increase by 172,460 acres to 606,720 acres; the R class would increase by 7,190 acres to 10,670 acres; and the U class would decrease by 20 acres to 20 acres.

All of the planning area (1,539,190 acres) would continue to be managed as open to ORV use.

Visual Resources

Under current management, no visual resource management (VRM) class I acreage exists (this is consistent with the MFPs [BLM, 1977a and BLM, 1979a]). Class acreages are based on inventory data as described in the MSA. Acreages are class II, 496,370 acres; class II, 383,270 acres; and class IV, 659,550 acres.

Under continuation of current management (see appendix V for impact analysis assumptions), increased development would cause a change in the VRM class acreage, as areas shift to a lower management class (higher class number) as they become increasingly developed. It cannot be predicted when this shift would occur, which classes would change, and to what extent. It is estimated, based on a case-by-case analysis through application of VRM objectives, that in 120 cases the contrast rating score would be found to exceed the VRM class objective. The number of scores that would exceed the class standards for the areas in which they are located could, over time, result in a change to the VRM class for a specific area.

Conclusion

VRM class acreages would remain the same (class I, 0 acres; class II, 496,370 acres; class III, 383,270 acres; and class IV, 659,550 acres). In about 120 cases, the VRM contrast rating scores would exceed class objectives.

Lands

Right-of-way corridors would not be designated under alternative A; however, a total of 1,485,600 acres would be available for rights-of-way under standard conditions (1,412,950 acres in SRRA, and 72,650 acres in FPU). Avoidance areas would total 53,590 acres (50,890 in SRRA, and 2,700 in FPU). No areas would be excluded from right-of-way grants.

The lands identified for disposal in alternative A represent a continuation of the existing situation and could be used by the public at large or for community expansion. A total of 6,820 acres are identified for disposal (5,780 acres in SRRA, and 1,040 in FPU).

Onsite cultural resource inventories may prevent disposal of some tracts under the laws that protect these resources. Other lands may be sold or patented after application and assessment, but these actions cannot be predicted and have not been included in this analysis.

A total of 1,780 acres (all in SRRA) would remain withdrawn from entry under alternative A. Additional acres could be closed to entry due to withdrawals applied on a case-by-case basis for specific lands actions.

No lands were identified for acquisition under alternative A.

Conclusion

Under alternative A, no corridors for rights-of-way would be designated, 1,485,600 acres would be available (standard conditions) for rights-of-way, 53,590 acres would be avoided, and no areas would be excluded from right-of-way use. A total of 6,820 acres would be identified for disposal. Lands withdrawn from entry would be 1,780 acres. No lands would be acquired.

ECONOMIC CONSIDERATIONS

The following discussion concentrates on Emery County and the Carbon-Emery multi-county area. Economic impacts are grouped by resource use. Only those anticipated changes of greater than 1 percent to personal, local, or regional revenues, costs, earnings, wealth, or employment are discussed. Those resource uses that could have an effect of this degree include minerals, soil and water, livestock, recreation, and other land uses. The BLM's budget impact on the local economy is also discussed.

Minerals

Use restrictions, such as leasing categories 2 (special conditions), 3 (no surface occupancy), and 4 (no lease), can affect the local economy by changing either the cost of conducting mineral activities or the amount of mineral activity.

Special conditions and the no-surface-occupancy requirement can increase the cost of mineral exploration and development by (1) changing the location, method, or equipment; (2) increasing the amount of coordination required with the BLM; (3) temporarily idling labor and equipment; (4) lengthening the duration of mineral exploration and development; and (5) delaying production and hence receipt of revenues.

In addition to increasing activity costs, special conditions and the no-surface-occupancy requirement can also lower the output value of mineral exploration and development. For example, changing the method of geophysical exploration can reduce the accuracy of the geophysical data obtained.

Much of the additional cost of complying with special conditions is spent in the local economy, thereby increasing local employment and earnings. However, these costs also decrease the amount of mineral activity, thereby decreasing local employment and earnings. The relationship between cost and the amount of mineral exploration and development has not been quantified, nor have the added costs imposed by most stipulations and special conditions. The net effect on local employment and earnings is unknown.

Excluding oil and gas activity in no-lease areas would result in a net decrease in mineral-related economic activity.

The I-70 Scenic Corridor ACEC would require plans of operation to be submitted for locatable mineral activity whenever the surface of the ACEC would be disturbed. Any special conditions imposed would be minor and would not affect the activity.

Except for the plans of operation required in the I-70 Scenic Corridor ACEC, management of mineral resources would not change. However, future oil and gas exploration is assumed to yield producing wells with a total production of 13,200 barrels of petroleum and 754,000 MCF of natural gas by the year 2000. Based on this greater level of mineral activity in the planning area, the following changes would occur.

		Current	Total in Year 2000	Change from Current
Emery County	Employment (jobs)	2	360	+298
	Earnings ($)	1,710,600	10,092,205	+8,382,600
	Revenue ($)	31,100	146,800	+115,700
Carbon-Emery County	Employment (jobs)	98	568	+470
	Earnings ($)	2,119,000	12,469,600	+10,350,600
	Revenue ($)	45,300	511,400	+466,100

Soil and Water

Most of the sediment that originates in the planning area enters Lake Powell, where it decreases the lake's electrical production, flood control, recreation, and water storage values by decreasing its useful life and by its gradual loss of size and storage capacity. Some sediment also enters downstream structures, such as small livestock reservoirs and diversion points, where it must be removed or the structure abandoned. Sediment yield resulting from the surface disturbance projected under this alternative would cause between $218,000 and $1,840,100 damage annually to downstream capital investments.

Salt picked up by water originating in or passing through the planning area increases the municipal, industrial, and agricultural costs associated with the use of saline water in the lower Colorado River basin. Salt loading resulting from the surface disturbance projected under alternative A would cause between $1,724,000 and $25,208,600 damage annually to water users in the lower Colorado River basin.

Livestock Grazing

One livestock operator would have more available public rangeland forage, and 32 would have less. Changes in available forage would change rancher earnings by affecting herd size, weight gain, calf survival rates, or operating costs. (Forage losses and gains under each alternative are discussed in the Grazing sections of this chapter.)

The number of operators affected, the degree of impact, and the related effects on local employment and earnings are presented in tables 56 and 57. The aggregate effect of the loss in available forage would decrease operator returns above variable cost by $13,710, a 5 percent decrease.

Based on the direct effects from the budget analysis and on the indirect and induced effects derived from a county economic model, it is estimated that the following changes would occur.

		Current	Total in Year 2000	Change from Current
Emery County	Employment (jobs)	155	156	1
	Earnings ($)	463,100	459,400	-3,700
	Revenue ($)	321,900	319,400	-2,500
Carbon-Emery County	Employment (jobs)	244	242	-2
	Earnings ($)	1,112,700	1,103,800	-8,900
	Revenue ($)	732,200	726,400	-5,800

TABLE 56

Number and Degree of Livestock Operator Impacts, Alternative A

	Operators with an Increase from Existing Use and Net Revenues			Operators Not Affected	Operators with a Decrease from Existing Use and Net Revenues		
	Over 51%	11 to 50%	1 to 10%		1 to 10%	11 to 50%	Over 51%
Public rangeland forage	0	0	1	106	25	6	1
Total feed requirements	0	0	1	106	32	0	0
Operator returns above variable costs	0	0	1	106	32	0	0

TABLE 57

Aggregate Economic Impacts to Livestock Operators, Alternative A

Livestock Operators	Existing Situation	Alternative A
Gross Revenue	$2,941,700	$2,920,700
Total Variable Cost	2,015,800	2,008,400
Returns Above Variable Cost	925,900	912,200
Returns to Labor and Investment[a]	166,900	158,100
Livestock Numbers (cattle)	9,282	9,206
(sheep)	3,776	3,761
Total Earnings, Emery County	$463,200	$459,500
Total Employment, Emery County (jobs)	157	156
Total Earnings, Carbon-Emery County	1,112,800	1,103,900
Total Employment, Carbon-Emery County	244	242

NOTE: These budgets assume that ranchers have no long-term outstanding debt, that all operating capital is borrowed, and that existing ranchers would not go out of business.

[a] Returns to labor and investment equal returns minus variable and fixed costs to management, non-hired labor, machinery, equipment, and land.

Any grazing permit change could affect ranch value and therefore operator wealth, particularly if the changes affect the ranch's total carrying capacity. The loss in available forage could decrease aggregate operator wealth by $35,500, a 0.1 percent decrease.

Lending institutions base loans on a number of factors, including the rancher's ability to repay the loan. The repayment ability is usually measured by the rancher's likely future income with the loan. Because aggregate rancher earnings are projected to decrease under this alternative, ranchers' abilities to repay loans should likewise decrease.

Base properties are used as collateral for some types of loans. Since base property values are either not affected or projected to decrease under this alternative, the level of total indebtedness allowed should decrease.

Recreation

Recreation-related impacts can affect the local economy by changing either (1) the number of people who visit the area, (2) their length of stay, or (3) their expenditure patterns.

Greater visitation, longer lengths of stay, or greater expenditures per day would increase visitor expenditures and resulting local employment and earnings. Because it has not been possible to quantify the relationship between management actions and visitation, length of stay, or expenditure patterns, most recreation-related economic impacts could not be quantified.

Recreation use of the planning area is projected to increase 30 percent by the year 2000 as a result of increasing incomes and populations in the western United States. This increase in use is projected to bring the following changes.

		Current	Total in Year 2000	Change from Current
Emery County	Employment (jobs)	21	27	+6
	Earnings ($)	182,000	236,700	+54,600
	Revenue ($)	27,300	35,400	+8,100
Carbon-Emery County	Employment (jobs)	38	49	+11
	Earnings ($)	487,000	503,000	+116,000
	Revenue ($)	63,300	82,300	+19,000

The relative mix of uses may change as a result of a changing mix of recreational opportunities (see impacts to recreation). The effect on total numbers of people, length of stay, or visitor expenditure patterns is unknown. Judging from the projected economic importance of recreation in the planning area (less than 0.1 percent of local employment, earnings, and taxing district revenues), the projected changes to the opportunity spectrum would have little effect on the local economy.

Existing commercial outfitters rely heavily on the P, SPNM, and SPM opportunity settings available in the planning area. The 30 percent loss of P and SPNM, and 11 percent loss of SPM opportunity settings could reduce the existing demand and/or projected increased demand for outfitter services. However existing and projected demand for commercial services in the planning area is small and would comprise a small portion of any outfitters business. The projected change in opportunity settings would therefore have little economic effect.

Desert bighorn sheep, antelope, deer, and elk populations are projected to increase slightly. The distance which hunters must travel and hunter success rates have been found to be the primary determinants of hunter pressure on many wildlife species [Cory and Martin, 1985; Wennergren, et al., 1973; Loomis, et al., 1985; Shalloof, 1985].

There is also evidence to suggest that primary nonconsumptive use is also influenced by the availability of wildlife [Krannich and Cundy, 1987; Kellert and Berry, 1985; Standard Research, Inc., 1987; Fletcher and King, 1987]. Since larger wildlife populations should increase both success rates and opportunities for viewing, more hunters and primary nonconsumptive users should be drawn to the area. Assuming that population/harvest, harvest/hunter, and population/primary nonconsumptive use ratios remain constant, projected wildlife use and related expenditures would bring the following changes.

		Current	Total in Year 2000	Change from Current
Emery County	Employment (jobs)	18	20	2
	Earnings ($)	165,400	174,300	14,900
	Revenue ($)	24,400	26,700	2,300
Carbon-Emery County	Employment (jobs)	48	52	4
	Earnings ($)	644,700	705,300	60,600
	Revenue ($)	38,700	42,300	3,600

Other Land Uses

The economic importance of other land uses in the planning area would not change. The lands identified for disposal, widely scattered through Castle Valley, would represent an increase of 4.3 percent in the existing private land base, having little or no effect on nearby land values. Under private ownership, these lands would increase taxing district revenues in Emery County by at least $8,600.

Plan Budget

Government personnel would be directly employed to implement the proposed plan. This plan would require the purchases of goods and services from the local economy, and government employees would also spend a portion of their income in the local economy. The 10 percent increased budget needed to implement this alternative would bring the following changes.

		Current	Total in Year 2000	Change from Current
Emery County	Employment (jobs)	8	9	+1
	Earnings ($)	96,200	105,700	+9,400
	Revenue ($)	2,100	2,300	+200
Carbon-Emery County	Employment (jobs)	33	36	+3
	Earnings ($)	619,900	680,700	+60,800
	Revenue ($)	16,300	18,900	+1,600

Conclusion

Mineral-related local employment, earnings, and taxing district revenues would increase. Sediment yield and salt loading from projected surface disturbance would increase. Livestock operator returns above variable cost, ranch value and associated local employment, earnings, and taxing district revenues would decrease. Due to increases in projected use, recreation-related employment, earnings, and taxing district revenues would increase The aggregate loss of P, SPNM, and SPM acreage could reduce the demand for commercial outfitter services in the area, although this effect would be insignificant. Larger big game populations would increase consumptive and nonconsumptive wildlife use and increase related local employment earnings and taxing district revenues. The land disposals would increase taxing district revenues in Emery County. The 10 percent increased budget needed to implement this alternative would increase local employment, earnings, and taxing district revenues.

SOCIAL CONDITIONS

None of the management actions would impact local communities so far as to noticeably affect existing social conditions.

Conclusion

Social conditions would not be affected.

ALTERNATIVE B

MINERAL COMPONENTS

Oil and Gas

Alternative B offers the least restrictive management concerning development of oil and gas resources in the planning area. Under this alternative, an additional 119,050 acres would be available for lease (an 8 percent increase over alternative A). No areas would be closed. Leasing category acreages under alternative B compare as follows to those under alternative A.

Category	Unit	Acres	Change from Alternative A
1	SRRA	1,416,050	+285,770
	FPU	75,350	+23,580
	Subtotal	1,491,400	+309,350
2	SRRA	45,730	+2,600
	FPU	0	-18,270
	Subtotal	45,730	-15,670
3	SRRA	0	-169,320
	FPU	0	-5,310
	Subtotal	0	-174,630
4	SRRA	2,060	-119,050
	FPU	0	0
	Subtotal	2,060	-119,050

Areas in category 2 would include one vegetation ACEC and R&PP leases, while category 4 would include the I-70 pictographs and two vegetation ACECs.

The opening of these areas to leasing is not expected to affect production, since most of the opened areas have low to moderate potential for oil and gas. The area remaining in category 4 is not large enough to affect oil and gas exploration.

Under alternative B, with fewer restrictions on geophysical operations, seismic work would increase 25 miles per year over alternative A to a total of 125 miles per year and then remain constant.

Production would be the same as under alternative A (13,200 barrels of petroleum and 754,000 MCF of natural gas) at year 2000.

Conclusion

Under alternative B, 119,050 more acres would be open to lease than under alternative A. Category 1 would increase from 1,182,050 acres to 1,491,400 acres; category 2 would decrease from 61,400 acres to 45,730 acres; category 3 would decrease from 174,630 acres to 0; and category 4 would decrease from 121,110 acres to 2,060 acres.

Geophysical work would increase from 100 to 125 miles per year.

Oil and gas production would be the same as that projected under alternative A, 13,200 barrels of petroleum and 754,000 MCF of natural gas in the year 2000.

Coal

Under alternative B, the no-surface-occupancy requirement would be lifted for the I-70 Scenic Corridor, increasing the acres available for coal exploration by 3,980 acres from alternative A to a total of 62,290 acres (33,720 in SRRA, 28,570 in FPU). The number of drill holes could increase by one per year, which is insignificant. There would be no change from alternative A in the acreage available for lease. Lifting the no-surface-occupancy requirement from the I-70 Scenic Corridor area would not affect production of 150,000 tons per year, since production is expected only from existing leases (no production would occur from any new leases before the year 2000).

Conclusion

While the acres available for lease (58,190 acres) would not change from alternative A, 3,980 more acres (a total of 62,290) would be available for coal exploration under standard conditions (without the no-surface-occupancy requirement). Coal production of 150,000 tons per year would not change.

Mineral Materials

Under alternative B, the establishment of two vegetation ACECs (both in SRRA) would reduce the area open to mineral material disposal by 2,060 acres from alternative A to 1,461,780 acres in SRRA and 75,350 acres in FPU (no change), for a total of 1,537,130 acres in the planning area.

Because there is no demand for mineral materials in the areas that would be closed to disposal, production would not change.

Conclusion

The area open to mineral material disposal would decrease by 2,060 acres (from 1,539,190 acres to 1,537,130 acres). The annual production rate would remain at 320,000 cubic yards by the year 2000, the same as under alternative A.

Locatable Minerals

Under alternative B, there would be a decrease of 2,060 acres in the area open to mineral entry, with 1,460,000 acres in SRRA, 75,350 acres in FPU, and a total of 1,535,350 acres in the planning area being open to mining claim location. Of the areas withdrawn from entry, 1,830 acres (all in SRRA) have high potential for uranium. The remainder of the withdrawn area has moderate, low, or no potential for uranium. Of the areas with high or moderate potential for gypsum, 910 acres would be withdrawn from entry. The remainder of the area withdrawn would have low to no gypsum potential. Areas withdrawn from entry would include two vegetation ACECs.

Under alternative B, standard conditions would be applied to 1,416,050 acres in SRRA and 75,350 acres in FPU, for a total of 1,491,400 acres in the planning area; special conditions would be applied to 43,950 acres of a vegetation ACEC (all in SRRA). Compliance with the special conditions would be required to the extent possible without curtailing operators' rights. Filing plans of operation and complying with special conditions would increase the operators' costs, which could result in an unquantified decrease in exploration and development work in those areas to which the special conditions apply. No lands were identified for disposal under alternative B.

Conclusion

The area open to entry would be 1,535,350 acres, 2,060 fewer acres than under alternative A.

BIOTIC COMPONENTS

Soils

Under alternative B, there would be an estimated decrease in soil loss from alternative A, because decreases in soil loss resulting from limiting ORV use would be greater than increases resulting from mineral activities, grazing increases, and lands actions.

Limiting ORV use may cause a decrease in soil loss of between 284,750 and 2,155,250 tons per year compared to between 427,300 and 3,232,500 under alternative A. However, concentration of ORV use may cause greater soil losses in those specific areas due to more compaction, more rilling and gullying, more vegetation losses, etc. In areas where ORV use is limited to designated roads and trails, however, the limitation may cause less soil to be lost as the non-designated roads and trails revegetate.

Although there is a net decrease in soil loss under this alternative, there would be increases in soil loss associated with some activities. An increase in soil loss of between 1,200 and 9,100 tons per year could be expected from the surface-disturbing activities associated with oil and gas and geophysical activity. An increase of between 370 and 2,800 tons per year of soil loss could be due to mining claims and assessment work. An increase of between 2,600 and 19,600 tons per year could be expected from livestock related range improvements.

The loss estimates are based on the amount of public land in the planning area. Disposal of public lands results in less BLM acreage available to contribute to total soil loss. Retention of public lands that would be disposed of under alternative A could account for an increase of between 26,830 and 216,500 tons of soil loss per year.

A 2,000-acre vegetation manipulation would be done in FPU. The value of land treatments, such as chainings, in reducing erosion and sediment yield is not clear. Long-term effects appear to be beneficial, not only for increasing ground cover (which stabilizes soils), but also for improving rilling and gullying on the soil types that would be treated in the resource area. Short-term losses occur from nearly any treatment technique but this would be balanced out by the improvement in cover over the long term [Hansen, 1986].

The soil losses contributed by other factors would continue to be as described under alternative A. Therefore, soil losses from all causes could represent a decrease of between 253,750 and 1,907,250 tons per year. Total soil loss could be between 7,009,990 and 59,447,050 tons per year (averaging 33,243,520 tons per year) by the year 2000.

Conclusion

Total soil loss per year could be between 7,009,050 and 59,447,050 tons per year (averaging 33,243,520 tons per year), a decrease of between 253,750 and 1,907,250 tons per year from alternative A.

Water

Surface water quality should improve slightly under alternative B compared to alternative A, a result of the lower rate of soil loss under alternative B (see Soils). This is because decreases in sediment and salt yield resulting from limiting ORV use would be greater than increases resulting from mineral activities, grazing increases, and lands actions.

Limiting ORV use may cause a decrease in sediment of between 113,900 and 862,100 tons per year and a decrease in salt of between 1,878 and 14,470 tons per year. Limiting ORV use should help keep sediment and salt yields at the present levels. Concentration of ORV use would occur. More sediment and salt may be produced in these concentrated areas due to more compaction, rilling and gullying, greater vegetation losses and other effects. In the case of limited to designated roads, however, the limitation may cause sediment and salt yields to decline as the nondesignated roads and trails are revegetated. The effect of these limitations would be greatest where ORV use is heavy.

Although there is a net decrease in sediment and salt yield under this alternative, there could be increases in sediment and salt yield associated with some activities.

An increase of 86 livestock waters and 56 miles of fence would occur under alternative B over alternative A. This could account for an increase of sediment of between 1,040 and 7,840 tons per year and an increase in salt of between 17 and 131 tons per year.

Oil and gas and geophysical activities could result in impacts to both surface and ground water. Sediment and salt yield increases could be expected from new roads and drilling pads. Sediment yield could increase by between 480 and 3,640 tons per year. Salt yield could increase by between 6 and 35 tons per year. Accidental fluid discharges during drilling operations could degrade surface water quality. Drilling could also cause aquifers to mix, resulting in ground water degradation. Blasting can alter aquifer characteristics affecting existing wells. Although impacts normally occur only from shots closer than 500 feet, a safe working distance must be determined on a case-by-case basis.

Activities associated with mining claims could adversely impact water resources. Road construction and extraction of materials could increase sediment by between 150 and 1,120 tons per year and increase salt yield by between 2 and 11 tons per year. Drilling and underground mining could cause aquifer mixing resulting in ground water degradation.

Mineral material operations in close proximity to perennial watercourses could destabilize and alter natural stream channels and disrupt the beneficial values of floodplains. These impacts could result in changes in the water tables and surface water flows and could make floods more destructive.

Estimates of sediment and salt yield are based on the amount of public land in the planning area. Retention or acquisition of public lands results in more BLM acreage available to contribute to sediment and salt yield. Sediment and salt may increase due to the retention of public lands disposed of under alternative A. This could account for an increase in sediment of between 10,730 and 86,610 tons per year. This land retention could also account for an increase in salt yield in SRRA of between 118 and 1,530 tons per year.

The 2,000-acre vegetation manipulation would have a negligible effect on water resources.

Other impacts to surface and ground waters would be as described under alternative A. The rate of sediment yield to the Colorado River could decrease by between 101,500 and 762,890 tons per year. Total sediment yield could be between 2,804,000 and 23,407,920 tons per year (averaging 13,297,410 tons per year) by the year 2000.

The rate of salt yield to the Colorado River could decrease by between 1,735 and 12,763 tons per year. Total salt yield could be between 27,735 and 418,154 tons per year (averaging 229,945 tons per year) by the year 2000.

Conclusion

Surface water quality should improve slightly under alternative B over alternative A. Total sediment yield could be between 2,804,000 and 23,407,920 tons per year (averaging 13,297,410 tons per year), a decrease of between 101,500 and 762,890 tons per year from alternative A. Total salt yield could be between 27,735 and 418,154 tons per year (averaging 229,945 tons per year), a decrease of between 1,735 and 12,763 tons per year from alternative A.

Ground water quality could decline slightly but the level of TDS in milligrams per liter cannot be quantified.

Air

Under alternative B, impacts to air quality would not change from alternative A.

Conclusion

Under alternative B, air quality in the planning area would remain good until the year 2000.

Vegetation

Under alternative B, a total of 17,384 acres of vegetation could be disturbed through the year 2000, a decrease of 37,160 acres from alternative A.

Disturbance would be short-term on approximately 17,134 of these acres and long-term on the remaining 250 (the Green River Scenic Loop). No lands have been identified for disposal under alternative B. The remainder of the decrease in vegetation disturbance would result from restrictions on ORV use (30,790 fewer disturbed acres). Most short-term vegetation losses would be regained through natural succession or within 5 years following reclamation with a site-specific seed mix. Causes and amounts of anticipated disturbance were listed by activity in table 54.

Anticipated changes in ecological condition under alternative B are shown in table 58. Impact analysis assumptions are given in appendix S.

TABLE 58

Anticipated Changes in Ecological Condition, Alternative B

Ecological Condition Class	Ecological Condition by Percent of Resource Area	
	Present (1985)	Future (2000)
Potential Natural Community	9	11
Late Seral	22	22
Mid Seral	47	45
Early Seral	9	9
Rock Outcrop/Badlands	13	13

Implementation of existing AMPs would allow the vegetation periodic rest from grazing, thus producing a higher density of livestock forage species and changing more acres to a higher seral stage.

The Bowknot Bend (1,830 acres), North Big Flat Top (190 acres), and San Rafael Reef (43,870 acres) relict vegetation areas would be designated as ACECs under this alternative, whereas no such designations were identified under alternative A. The Hebes Mountain relict vegetation area would not receive special protection under alternative B.

Threatened or Endangered Plants

The activities under this alternative that would have the potential to disturb habitat for T/E plants are uncontrolled ORV use, mining activities that disturb fewer than 5 acres, and the estimated 200 acres of surface disturbance from mining. The T/E plant habitat areas would be monitored and management actions implemented to prevent impacts to the plants.

Conclusion

Short-term loss of vegetation would decrease from 47,474 acres to 17,134 acres, and long-term loss would decrease from 7,070 acres to 250 acres, for a total of 17,384 acres disturbed. Changes to higher seral stages would result. Three relict vegetation areas would receive special protection. There would be no adverse impact to T/E species.

Wild Horses and Burros

Under alternative B, domestic livestock numbers would be allowed to increase to the maximum number the range could support. Livestock management would be more intense. Most forage available would be used by livestock. About 2,340 AUMs would no longer be available for wild equid use. This, added to the fact that no forage was reserved for equids during adjudication, would limit the capacity of the range to support these animals. While the habitat area would remain at 475,680 acres, wild horse and burro populations would have to be reduced to 1971 numbers. Wild horses would be reduced from a range of 200 to 235 head to a range of 20 to 35 head; wild burros would be reduced from a range of 70 to 100 head to a range of 10 to 25 head, when compared to alternative A.

Conflicts in use between wild equids and livestock would be resolved and adjustments in specific forage use levels would be made at the activity plan level, in conjunction with grazing decisions, or at any time deemed necessary as a result of rangeland monitoring.

Conclusion

Wild horses would be maintained at a range between 20 and 35 head and wild burros between 10 and 25 head. The forage required to support these animals at the upper limits is 495 AUMs.

Forage use levels may be adjusted beween wild equids and livestock based on monitoring data.

Wildlife

Desert Bighorn Sheep

Crucial habitat for desert bighorn sheep would decrease from 150,000 acres under alternative A to about 120,000 acres, a decrease of 30,000 acres from alternative A.

The desert bighorn sheep population would not reach its full potential, primarily because of the following factors.

- The lack of seasonal conditions on oil and gas leases and other development activities to protect lambing and rutting on crucial habitat would result in the loss of about 50 sheep, primarily due to stress.
- The limitation of ORV use to existing roads and trails and would reduce the acres of crucial desert bighorn sheep habitat affected to approximately 20,000, resulting in the loss of about 45 sheep;
- The allocation of 3,480 acres of Buckhorn Draw to livestock would reduce the number of desert bighorn sheep from 6 assumed to be currently using the area to about 1 sheep; and
- Livestock grazing at active use would increase competition for forage and space; the increase in livestock numbers would also increase the potential for disease transmission between domestic livestock and desert bighorn sheep, making possible a disease

outbreak that could result in the loss of at least 50 desert bighorn sheep.

Under alternative B, the population of desert bighorn sheep would decrease from 500 to about 350, about 150 fewer animals by the year 2000 than under alternative A.

Antelope

The antelope habitat area would decrease from 507,000 acres under alternative A to 506,320 acres, a decrease of 680 acres from alternative A. The decrease in antelope habitat and numbers would result from the following factors.

- The projected increase in development activities and the lack of seasonal or special conditions on these activities would result in the loss of 680 acres of antelope habitat from alternative A.
- Maximizing livestock use would increase competition for spring grasses and forbs and for available water sources in the crucial antelope habitat area.

The population of antelope would decline from 700 to about 400, 300 fewer animals than under alternative A.

Mule Deer and Elk

Crucial habitat for mule deer and elk would decrease to 33,710 acres and 17,700 acres respectively, a decrease from alternative A of 1,790 acres for mule deer and 500 acres for elk.

The decline in the mule deer and elk habitat would result from the following factors.

- Livestock grazing at full active use would allow the livestock numbers on allotments containing crucial mule deer and elk winter range to increase to 32,714 AUMs, an increase of 13,671 AUMs (72 percent); this increase would cause a direct loss of forage available to mule deer and elk on the winter and spring range (mule deer and elk reproductive success and fawn survival depend largely on this forage); approximately 1,600 fewer mule deer and 125 fewer elk would be supported (25 percent of population) because of livestock grazing at full active use.
- Within the Wildlife Allotment, 630 acres would be allotted to livestock, reducing the number of elk from 70 assumed to be currently using the allotment to about 48. The allotment does not contain any crucial mule deer winter range.
- Of the 1,730 acres of unalloted rangeland in the planning area, 1,240 acres are crucial mule deer and elk winter range. Allotting this range to livestock would reduce its capacity to support mule deer and elk. The land currently supports about 62 mule deer and 16 elk; these numbers would be reduced to about 16 mule deer and 4 elk;
- Assuming that each mule deer needs 10 acres of crucial habitat and elk need 40 acres of crucial habitat, oil and gas and mineral material activity on 550 acres would lessen the number of animals the habitat could support (55 fewer deer and 15 fewer elk by the year 2000).
- The removal of seasonal conditions from oil and gas leases, rights-of-way, and other development activities on 35,500 acres of mule deer crucial winter range and on 18,200 acres of elk crucial winter range would allow surface disturbance related to development activities, resulting in 51 fewer mule deer and 24 fewer elk.
- Limiting ORV use to existing roads and trails would reduce the amount of crucial mule deer and elk habitat affected. (ORV use would not be seasonally restricted.)

The populations of mule deer and elk would decline from about 6,620 and 600 respectively to about 4,870 and 410 respectively, a decrease of about 1,750 mule deer and 190 elk from alternative A at year 2000.

Riparian and Aquatic Habitat

Protection from ORV use would favor riparian and aquatic habitat; however, the increase in livestock grazing would prevent any significant improvement. Riparian and aquatic habitat would remain at its current size and condition (11,430 acres in SRRA and 3,350 acres in FPU, for a total of 14,780 acres in the planning area).

Threatened or Endangered Animals

Maintaining the current size and condition of riparian habitat would ensure reproduction of cottonwood trees for bald eagle roosts. There would be no impact to the bald eagle under this alternative.

The restriction on development activities and limiting ORV use to existing roads and trails would limit any potential impact to the peregrine falcon's nest and the ferruginous hawk nests. Mining claim work (if less than 5 acres) would have the potential to impact these birds, but habitat would be monitored and management actions implemented to prevent such impacts. The prairie dog towns, potential black-footed ferret habitat, would be protected from potential disturbance from ORV use in this alternative.

Conclusion

Habitat for desert bighorn sheep would decrease to 120,000 acres. Desert bighorn sheep populations would decrease to 350 animals.

Habitat for antelope would decrease to 506,320 acres. Antelope populations would decline to 400 animals, 300 fewer than under alternative A.

Crucial habitat for mule deer and elk would decrease to 33,710 acres and 17,700 acres respectively. Mule deer and elk populations would decline to about 4,870 mule deer and 410 elk.

Riparian and aquatic habitat would remain at 14,780 acres; related habitat for T/E wildlife species would remain unchanged. There would be no adverse impacts to T/E animals under this alternative.

HUMAN USES

Grazing

Under alternative B, all available public land would be allotted for grazing except Bowknot Bend (1,830 acres) and the North Big Flat Top (190 acres). However, since these areas are inaccessible to livestock, the exclusions would not represent a decrease in grazing area. Grazing would be allowed on 1,620,820 acres (8,700 more than in alternative A), in a total of 101 allotments. An additional two allotments would be created by licensing previously unallotted public lands. Two allotments would be combined with other allotments for improved management.

Livestock AUMs could increase under alternative B due to the construction of livestock water developments which would enable currently unusable areas to be grazed by livestock. The 5 year average licensed use could increase to 96,006 AUMs, an increase of 39,845 AUMs over alternative A. Active preference could also increase to 96,006 AUMs, an increase of 8,464 AUMs over alternative A.

The increase in active AUMs would result from the construction of 118 livestock water developments (7,182 AUMs), and a reduction in disturbance from ORVs (8,721 AUMs).

Grazing during the critical spring growth period without periodic rest would continue on 32 allotments, as compared to 77 allotments in alternative A. In addition to the 6 existing allotment management plans (AMPs) implemented, 17 previously written plans would be modified before implementation and 44 new plans would be implemented. These 67 AMPs would provide for periodic winter and spring seasonal rest to allow an increase in vigor and density of livestock forage species. Range improvements in the allotments covered by these AMPs would also help correct problems of uneven livestock distribution. The construction of livestock waters would aid livestock distribution as well as enabling previously unusable acres to be grazed by livestock.

Conclusion

The area available for livestock grazing would increase to 1,620,820 acres, an increase of 8,700 acres compared to alternative A.

Livestock forage could increase to 96,006 AUMs, an increase of 39,845 AUMs from 5-year average licensed use and an increase of 8,464 AUMs from active preference.

Forest Product Use

Of the 451,270 forested acres, the area available for designation for private and commercial forest product harvest would increase by 1,790 acres from alternative A to 437,450 acres because of relict vegetation and cultural ACECs and developed recreation site restrictions. A 2,000-acre vegetation manipulation in FPU would allow these areas to be better utilized for woodland harvest but would not increase acreage available for harvest because the areas were already considered available. These changes in acreage would not affect the available supply to meet the demand for dead wood and forest product harvest. Under alternative B, all of the areas excluded from harvest (13,820 acres) except 510 acres would be available for campfire use. That area would be excluded for cultural ACECs and developed recreation site restrictions.

The area used for harvest of woodland products would be increased by a 2,000-acre vegetation manipulation, which would remove pinyon and juniper trees and replace them with grasses, forbs, and shrubs. The total area of use would be 2,000 acres more than alternative A, but still less than 1 percent of the forested area.

Conclusion

As in alternative A, based on past use and present harvest, an adequate supply of dead and live forest products should be available through the year 2000, or 437,450 acres, an increase of 1,790 acres from alternative A.

Cultural Resources

Under alternative B, about 6,712 of the estimated 70,000 cultural resources would be damaged or destroyed, a decrease of 23 from alternative A. Although more sites would be damaged by increasing mineral exploration and grazing, the overall impact would be smaller because no sites would be affected by land disposal actions.

The number of cultural resources available for use would increase to 2,530, an increase of 41 over alternative A. Most of these sites would be recorded in inventories required by the standard operating procedures for increases in mineral and grazing activities.

Conclusion

Under alternative B, about 6,712 cultural resource sites would be damaged or destroyed (a decrease of 23 from alternative A). About 2,530 cultural resource sites (41 more than under alternative A) would be available for use.

Recreation

Under alternative B, opportunities to engage in activities in undeveloped settings would decrease, and opportunities to engage in activities in more developed (roaded) types of settings would increase. The current ROS classes would continue to shift toward the RN class. The P class would total 18,650 acres, a decrease of 51,030 acres from alternative A. The SPNM class would total 194,650 acres, a slight gain of 11,240 acres over alternative A. The SPM class would total 629,060 acres, a decrease of 33,810 acres from alternative A. The RN class would total 684,580 acres, an increase of 77,860 acres over alternative A. The R class areas would total 12,210 acres, an increase of 1,540 acres over alternative A. The U class would total 40 acres, an increase of 20 acres over alternative A.

Alternative B would virtually eliminate P class areas, leading to a reduction in the availability of primitive recreation opportunities and displacing visitors to other locations. Intensive mineral and grazing development and the resultant support facilities, rights-of-way, utility corridors, pipelines, and roads would permanently change primitive and semiprimitive class areas. Restrictions and constraints on recreation activities would increase as both recreation use and development of other resources expanded, displacing some users to other locations. The decrease in scenic quality resulting from the additional increase in development activities would negatively affect commercial recreation visitor days.

Cross-country recreational ORV use would be constrained under alternative B. Opportunities for cross-country travel would be foregone. ORV use would be limited to existing roads and trails on 1,493,230 acres to protect land leases, the I-70 pictographs, and to eliminate conflicts with livestock grazing. ORV use would be limited to designated roads and trails on 43,940 acres to protect relict vegetation areas. A total of 2,020 acres would be closed to ORV use to protect relict vegetation on Bowknot Bend and the North Big Flat Top. The increased recreation use would damage undeveloped camping locations.

The large increase in livestock numbers would reduce the quality of the recreation experience due to trampling of vegetation and increased deposition of fecal matter in dispersed campsites. The increase in livestock numbers would reduce wildlife populations, creating a negative secondary impact to recreation by reducing wildlife viewing and hunting opportunities.

Unusual recreation opportunities and scenic values identified in the wild and scenic rivers eligibility and potential classification study for the San Rafael River, Labyrinth Canyon (Green River), and Muddy Creek (appendix J) could be reduced with resource development in or adjacent to the canyons.

Conclusion

Opportunities for activities in undeveloped settings would decrease, and opportunities for activities in a facility-dependent setting would increase. The P class would total 18,650 acres, a decrease of 51,030 acres; the SPNM class would total 194,650 acres, a slight increase of 11,240 acres; the SPM class would total 629,060 acres, a decrease of 33,810 acres; the RN class would total 684,580 acres, an increase of 77,860 acres; the R class would total 12,210 acres, an increase of 1,540 acres; and the U class would total 40 acres, an increase of 20 acres over alternative A.

Opportunities for ORV exploration and cross-country travel would be reduced by the limitation of ORV use to existing roads and trails on 1,493,230 acres, the limitation to designated roads and trails on 43,940 acres, and the closure of 2,020 acres to ORV use.

Visual Resources

Alternative B impacts to the visual resources would be similar to those described under alternative A. VRM class acres would remain the same with class II, 496,370 acres; class III, 383,270 acres; and class IV, 659,550 acres. However, because of the increased level of development under this alternative, in 150 cases, the VRM contrast rating scores would exceed class objectives. This is an increase of 30 over alternative A projections.

Conclusion

VRM class acreages would remain the same, with 496,370 acres in class II; 383,270 acres in class III; and 659,550 acres in class IV.

It is projected that by the year 2000, in 150 cases (an increase of 30 cases from alternative A), visual contrast rating scores would exceed the VRM class objectives for that area.

Lands

Under alternative B, 27,340 acres would be designated as right-of-way corridors (22,870 acres in SRRA, and 4,470 in FPU, all increase over alternative A). Lands available (standard conditions) for rights-of-way outside corridors would total 1,464,060 acres (1,393,180 in SRRA (a decrease of 19,770 acres), and 70,880 acres in FPU (a decrease of 1,770 acres)). A total of 45,760 acres (all in SRRA) would be avoided (a decrease of 7,830 acres from alternative A (5,130 fewer acres in SRRA, and 2,700 fewer in FPU)). Exclusion areas would total 2,030 acres (all in SRRA and all increase from alternative A).

Because parcels that may be valuable for grazing would be eliminated from consideration for disposal, no lands would be available for disposal under alternative B (a decrease from alternative A of 5,780 acres in SRRA, and 1,040 acres in FPU).

Lands withdrawn from entry would increase by 2,060 acres to total 3,840 acres (all SRRA). Bowknot Bend and North Big Flat Top relict vegetation ACECs would be withdrawn.

No lands were identified for acquisition under alternative B.

Conclusion

Corridors for rights-of-way would be designated on 27,340 acres; lands available (standard conditions) for rights-of-way would decrease; avoided areas would be decreased to 45,760 acres; and excluded areas would be increased to 2,030 acres. No lands would be available for disposal (a decrease from alternative A), and lands withdrawn from entry would increase to 3,840 acres. No lands would be acquired.

ECONOMIC CONSIDERATIONS

Minerals

The area covered by special conditions would decrease 15,670 acres (25 percent) relative to alternative A, which should reduce mineral exploration and development costs in these areas. The 293,680-acre (99 percent) reduction in area closed to surface occupancy or permanent resource use or production would essentially increase the area available for mineral activity. Overall, the reduced cost and added available area would encourage increased oil and gas and locatable mineral activity. The lower cost would also reduce mineral-related expenditures within the local economy, while activity in newly opened areas would increase mineral-related expenditures. The net effect on the local economy is unknown.

Based on the assumed increase in oil and gas exploration and on increased locatable mineral exploration and mineral-related employment, the following economic changes are anticipated.

		Total	Change from Alternative A
Emery County	Employment (jobs)	368	+8
	Earnings ($)	10,291,500	+198,300
	Revenue ($)	152,600	+5,700
Carbon-Emery County	Employment (jobs)	580	+12
	Earnings ($)	12,716,800	+247,100
	Revenue ($)	586,400	+15,000

Soil and Water

Sediment yield resulting from the surface disturbance projected under this alternative would decrease annual damage to downstream capital investments by $11,400 to $84,800 over alternative A. Salt loading resulting from the surface disturbance projected under this alternative would decrease annual damage to water users in the lower Colorado River basin by $150,100 to $1,127,600 from alternative A.

Livestock Grazing

Of the 139 livestock operators, 134 would have more forage, 1 would have less, and 4 would not be affected. (Forage losses and gains under the alternatives are discussed in the Grazing sections of this chapter.) Changes in available forage would change rancher income by affecting herd size, weight gain, calf survival rates, or operating costs.

The number of operators affected, the degree of impact, and the related effects on local employment and earnings are presented in tables 59 and 60.

These changes would aggregate to an average 71 percent increase in public rangeland forage available to 54 livestock operators. Because a determination on how to divide the forage from the new areas among operators, all forage was analyzed as belonging to a single hypothetical operator. None of the livestock operators would have less available forage. The aggregate effect of the additional available forage would increase operator returns above variable cost by $846,700, a 93 percent increase.

Based on the direct effects from the budget analysis and on the indirect and induced effects derived from a county economic model, local employment, earnings, and taxing district revenues would increase as follows.

		Total	Change from Alternative A
Emery County	Employment (jobs)	228	+72
	Earnings ($)	671,600	+212,100
	Revenue ($)	466,800	+147,400
Carbon-Emery County	Employment (jobs)	354	+112
	Earnings ($)	1,613,500	+509,600
	Revenue ($)	1,061,800	+335,300

TABLE 59

Number and Degree of Livestock Operator Impacts, Alternative B

	Operators with an Increase from Existing Use and Net Revenues			Operators Not Affected	Operators with a Decrease from Existing Use and Net Revenues		
	Over 51%	11 to 50%	1 to 10%		1 to 10%	11 to 50%	Over 51%
Public rangeland forage	54	58	22	4	1	0	0
Total feed requirements	11	50	73	4	1	0	0
Operator returns above variable costs	33	45	56	5	1	0	0

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TABLE 60

Aggregate Economic Impacts to Livestock Operators, Alternative B

Livestock Operators	Alternative A	Alternative B
Gross Revenue	$2,920,700	$4,193,700
Total Variable Cost	2,008,400	2,434,700
Returns Above Variable Cost	912,200	1,759,000
Returns to Labor and Investment[a]	158,100	707,300
Livestock Numbers (cattle)	9,206	13,500
(sheep)	3,761	5,645
Total Earnings, Emery County	$459,500	$671,600
Total Employment, Emery County (jobs)	156	338
Total Earnings, Carbon-Emery County	1,103,900	1,613,500
Total Employment, Carbon-Emery County	242	353

NOTE: These budgets assume that ranchers have no long-term outstanding debt, that all operating capital is borrowed, and that existing ranchers would not go out of business.

[a] Returns net of variable and fixed costs to management, non-hired labor, machinery, equipment, and land.

Any grazing permit change could affect ranch value and therefore operator wealth, particularly if the changes affect the ranch's total carrying capacity. The increase in available forage would increase aggregate operator wealth by between $423,200 and $1,992,200, a 1.6 to 7.6 percent increase.

Lending institutions base loans on a number of factors, including the rancher's ability to repay the loan. The repayment ability is usually measured by the rancher's likely future income with the loan. Because aggregate rancher income is expected to increase under this alternative, ranchers' abilities to repay loans should likewise increase.

Base properties are used as collateral for some types of loans. Since base property values are either not affected or projected to increase under this alternative, the level of total indebtedness allowed should increase.

Recreation

Most recreation-related economic impacts could not be quantified because it has not been possible to quantify the relationship between management actions and visitation, length of stay, and/or expenditure patterns. The relative mix of uses may change as a result of a changing mix of recreational opportunities. Eliminating recreational cross-country travel would probably reduce overall ORV use of the area. However, judging from the projected economic importance of recreation in the planning area (less than 0.1 percent of local employment, earnings, and taxing district revenues, the 16 percent area loss of P and SPNM settings and corresponding increase of other recreation settings, and the reduced level of ORV use, would have little affect on local economic conditions.

Existing commercial outfitters rely heavily on the P, SPNM, and SPM opportunity settings available in the planning area. The 10 percent loss of P and SPNM, and 16 percent loss of SPM opportunity settings from alternative A could reduce the existing demand and/or projected increased demand for outfitter services. Because projected demand for commercial services is small and would comprise a small portion of any outfitter's business, these changes in opportunity settings would have little economic effect.

Desert bighorn sheep, antelope, deer, and elk populations are projected to decrease from alternative A. Assuming that population/harvest, harvest/hunter, and population/primary nonconsumptive use ratios remain constant, projected wildlife use and related expenditures would decrease local employment, earnings, and taxing district revenues as shown here.

		Total	Change from Alternative A
Emery County	Employment (jobs)	14	-7
	Earnings ($)	124,200	-50,000
	Revenue ($)	19,000	-7,600
Carbon-Emery County	Employment (jobs)	37	-15
	Earnings ($)	502,900	-202,400
	Revenue ($)	30,100	-12,100

Other Land Uses

Other land uses are affected by special conditions, no surface occupancy, and closed to resource use and production zones in a similar manner to mineral activities. The less restrictive nature of alternative B is not expected to affect these other land uses and their related local economic importance. Some activities, within areas of restricted ORV use would require additional coordination with the BLM through a lands action.

The cost of environmental review of major utility lines is typically $8,000 to $15,000 per mile. This review would cost only an estimated $1,500 to $2,000 per mile in the 27,340 acres of utility corridors proposed for designation under this alternative [Pacific Gas, 1981].

Plan Budget

The 31 percent increased budget over alternative A needed to implement this alternative would bring the following economic changes.

		Total	Change from Alternative A
Emery County	Employment (jobs)	12	+3
	Earnings ($)	138,000	32,300
	Revenue ($)	3,000	+700
Carbon-Emery County	Employment (jobs)	47	+11
	Earnings ($)	889,000	+208,200
	Revenue ($)	24,700	+5,800

Conclusion

Mineral-related local employment, earnings, and taxing district revenues are projected to increase. Sediment- and salinity-related costs would decrease. Livestock operator returns above variable costs, ranch value, and associated local employment, earnings, and taxing district revenues would increase. The aggregate loss of P, SPNM, and SPM acreage could reduce the demand for commercial outfitter services in the area, although this effect would be insignificant. Wildlife-related local employment, earnings, and taxing district revenues would decrease. Fewer management restrictions would reduce the cost of surface-disturbing activities in some areas; but the net effect would be insignificant. The fewer land disposals would decrease taxing district revenues. The environmental review cost of major utility lines would decrease within the utility corridors. The increased budget needed to implement this alternative would slightly increase employment, earnings, and taxing district revenues.

SOCIAL CONDITIONS

None of the management actions would impact local communities so far as to noticeably affect existing social conditions.

Conclusion

Social conditions would not be affected.

ALTERNATIVE C

Mineral Components

Oil and Gas

The establishment of scenic ACECs would reduce the area open to lease by 351,710 acres from alternative A, but this decrease would not affect production, since most of the closed area has low to moderate oil and gas potential (appendix Q). Leasing category acreages under alternative C compare as follows to those under alternative A.

Category	Unit	Acres	Change from Alternative A
1	SRRA	181,450	-948,830
	FPU	12,260	-39,510
	Subtotal	193,710	-988,340
2	SRRA	784,020	+740,890
	FPU	58,270	+40,000
	Subtotal	842,290	+780,890
3	SRRA	28,250	-141,070
	FPU	2,120	-3,190
	Subtotal	30,370	-144,260
4	SRRA	470,120	+349,010
	FPU	2,700	+2,700
	Subtotal	472,820	+351,710

The decrease in acreage under category 1 and the increase under category 2 would result from the addition of seasonal restrictions for wildlife habitat (desert bighorn sheep, elk, mule deer, and antelope) and restrictions on ROS class areas. Such restrictions would increase operating and production costs, but are not expected to affect production. The category 2 area includes high, moderate, and low oil and gas potential (appendix Q).

Restrictions on surface occupancy (category 3) would include riparian and aquatic habitat and cultural ACECs. These areas mostly have low to moderate oil and gas potential.

The closures to leasing (category 4) would affect developed recreation sites, primitive areas, and scenic ACECs. Most of the areas that would be closed have low and moderate oil and gas potential.

Protective conditions would be imposed on geophysical operations in the primitive areas and ACECs, but as in alternative A, 100 miles of seismic line are expected.

Oil and gas production would be the same as in alternative A, 13,200 barrels of petroleum and 754,000 MCF of natural gas.

Conclusion

Under alternative C, the area open to leasing would decrease by 351,710 acres. The acreage in category 1 would decrease from 1,130,280 acres to 193,710 acres; the acreage in category 2 would increase from 61,400 acres to 842,290 acres; the acreage in category 3 would decrease from 174,630 acres to 30,370 acres; and the acreage in category 4 would increase from 121,110 acres to 472,820 acres. The miles of seismic line run per year would be 100, the same as under alternative A. The annual oil and gas production rates would be the same as under alternative A, 13,200 barrels of petroleum and 754,000 MCF of natural gas in the year 2000.

Coal

Under alternative C, 58,310 acres (32,440 acres in SRRA, and 25,870 acres in FPU) would be available for coal exploration (no change from alternative A). However, the coal lease area would decrease by 3,980 acres from alternative A to a total of 54,210 acres because of the I-70 Scenic Corridor no-lease-or-permit requirement. Since coal leasing would not be allowed in the scenic corridor, there would be no interest in obtaining coal information from that area.

In addition, coal exploration would be precluded on 210 acres in SRRA and 70 acres in FPU by no-surface-occupancy requirements to protect riparian lands. However, these requirements would not affect coal drilling, because (1) coal exploration companies would not drill in stream areas, since the ground is prone to drill hole sloughage; and (2) coal drilling regulations already require protection of riparian zones.

Special conditions would be imposed to protect wildlife habitat and SPM ROS class areas. The rest of the KRCRA would be available for coal exploration under standard conditions (11,900 acres in SRRA, and 7,580 in FPU).

Under alternative C, the areas available for leasing would be 3,980 fewer acres than under alternative A (1,280 in SRRA, and 2,700 in FPU) because of the no-lease requirement inside the I-70 Scenic Corridor. A total of 54,210 acres (28,340 in SRRA, and 25,870 in FPU) would be available for leasing. Of these areas, special conditions would be applied to leases on 20,330 acres in SRRA and 18,220 acres in FPU to protect wildlife habitat and ROS class areas.

The special conditions would not affect coal production (150,000 tons per year), since current production is from existing leases where underground mining methods are used exclusively. No new surface facilities are planned for coal operations on public lands, and no new leasing is projected in the Emery Coal Field by the year 2000. Should leasing interest occur, stipulations can be attached to the lease to mitigate or eliminate impacts to resources identified for protection under alternative C.

No-surface-occupancy restrictions to protect riparian areas would cover 210 acres in SRRA and 70 acres in FPU. This action would not affect coal production, since underground-mining-only stipulations can be attached to the lease, and because surface facilities would not otherwise be allowed in riparian areas.

Conclusion

Under alternative C, 58,310 acres would be available for coal exploration. The area available for leasing would be 3,980 fewer acres than under alternative A. Coal production (150,000 tons per year) would not change from alternative A.

Mineral Materials

Under alternative C, the area open for disposal of mineral materials would be reduced to protect ACECs, riparian and aquatic habitat, and ROS classes P and SPNM. The area available for disposal of mineral materials would total 1,032,150 acres (961,620 acres in SRRA and 70,530 acres in FPU); this represents a decrease of 507,040 acres from alternative A (502,220 fewer acres in SRRA, and 4,820 fewer acres in FPU).

The reduction in disposal area would not affect production of 320,000 cubic yards because the areas closed to mineral material disposal are generally roadless areas, where there is no demand for mineral materials.

Conclusion

Under alternative C, the area open to mineral material disposal would decrease to 1,032,150 acres, a decrease of 507,040 acres from alternative A. Annual production rate would be 320,000 cubic yards, the same as projected under alternative A.

Locatable Minerals

Under alternative C, 1,064,590 acres would be open to mineral entry (991,940 acres in SRRA, and 72,650 in FPU) This would be a decrease of 472,820 acres (470,120 fewer in SRRA, and 2,700 fewer in FPU) from alternative A. Of the areas withdrawn from entry, a total of 177,270 acres (all in SRRA) have high potential for uranium. The remainder of the withdrawn area has moderate, low, or no potential for uranium. Of the areas with high or moderate potential for gypsum, 133,440 acres (all in SRRA) would be withdrawn from entry. The remainder of the area withdrawn would have low to no gypsum potential (appendix Q). Areas withdrawn from entry would include scenic ACECs and ROS classes P and SPNM.

Under alternative C, standard conditions would be applied to 377,140 acres in SRRA and 55,480 in FPU, for a total of 432,620 acres in the planning area. Special conditions would be applied to 614,800 acres in SRRA and 17,170 in FPU, for a total of 631,970 acres in the planning area. The special conditions would apply to vegetation and cultural ACECs, developed recreation sites, riparian and aquatic habitat, and SPM ROS class areas. Compliance with the special conditions would be required to the extent possible without curtailing operators' rights. Filing plans of operation and complying with the special conditions would increase the operators' costs, which could result in an unquantified decrease in exploration and development work. If 6,970 acres identified for land disposal are sold, the area open for mineral entry would be reduced.

Conclusion

The area open to mining claim location would decrease by 472,820 acres to 1,064,590 acres.

BIOTIC COMPONENTS

Soils

Under alternative C, there could be a decrease in soil loss over alternative A. This is because decreases in soil loss from ORV designations, changes in livestock management and mineral activities would be greater than increases resulting from lands actions.

ORV use designations may cause a decrease in soil loss of between 267,750 and 2,026,500 tons per year under this alternative (see alternative A). Continuing to leave a portion of the resource area open to ORVs could allow continued increase in soil loss because of the increased surface disturbance (destruction of vegetation, soil compaction, and disturbance of the soil surface). These impacts could be stopped in areas closed to ORV use. The effects should gradually taper off to pre-ORV levels as vegetation and soils recover to natural levels.

Limiting ORV use in the rest of the area (seasonal closures, existing roads and trails) may help keep soil loss at present levels. In the case of limited to designated roads, the limitation may cause soil loss to decline as the nondesignated roads and trails are revegetated. The effect of these limitations would be greatest where ORV use is heavy.

Another decrease in soil loss under this alternative may be due to changes in livestock grazing management. These changes are either closing areas to livestock grazing or changing the season of use. Soil loss due to livestock changes could decrease by between 1,200,500 and 9,897,500 tons per year. Soil loss due to surface-disturbing activities associated with livestock-related range im-

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provements could decrease by between 750 and 5,600 tons per year. Riparian and aquatic area closures to livestock grazing could decrease soil loss by between 17,230 and 156,000 tons per year.

Coal operations could decrease soil loss from between 50 and 320 tons per year in the planning area.

Reductions in mining claim activity and related assessment work could result in a decrease in soil loss of between 180 and 1,400 tons per year from alternative A.

Although there is a net decrease in soil loss under this alternative, there could be an increase in soil loss associated with some activities. Soil loss may increase because public lands are retained that would be disposed of under alternative A or because of land acquisitions that would not have occurred under alternative A. Estimates of soil loss are based on the amount of public land in the planning area. Disposal of public lands results in less BLM acreage available to contribute to total soil loss. Retention or acquisition of public lands results in more BLM acreage available to contribute to total soil loss. Land disposals could account for a decrease in soil loss of between 7,500 and 44,380 tons per year from alternative A. Land acquisition could increase soil loss by between 50,850 and 328,300 tons per year.

A 2,000-acre vegetation manipulation would be done in FPU. The value of land treatments such as chainings in reducing erosion and sediment yield is not clear. Long-term effects appear to be beneficial, not only for increasing ground cover (which stabilizes soils), but also for improving rilling and gullying on the soil types that would be treated in the resource area. Short-term losses occur from nearly any treatment technique but this would be balanced out by the improvement in cover over the long term [Hansen, 1986].

The soil losses contributed by other factors would continue to be as described under alternative A. Therefore, soil losses from all causes could represent a decrease of between 1,443,110 and 11,803,450 tons per year of soil loss. Total soil loss could be between 5,820,630 and 49,580,850 tons per year, averaging 27,700,740 tons per year (a decrease of 6,623,280 tons per year) by the year 2000.

Conclusion

Total soil loss could be between 5,820,630 and 49,580,850 tons per year, a decrease of between 1,443,110 and 11,803,450 tons per year. The average soil loss is estimated at 27,700,740 tons per year, a decrease of 6,623,280 tons per year.

Water

Surface water quality should improve under alternative C compared to alternative A, a result of the lower rate of soil loss that would occur under this alternative. Decreases in sediment and salt yield from ORV use designations and changes in livestock management and mineral activities would be greater than increases resulting from lands actions.

ORV use designations may cause a decrease in sediment yield of between 107,100 and 810,600 tons per year and a decrease in salt yield of between 1,766 and 13,610 tons per year under this alternative. Continuing to leave areas open to ORV use may allow continued increases in sediment and salt yield because of increased surface disturbance (destruction of vegetation, soil compaction, and disturbance of the soil surface). The effects would be greatest in those areas of saline soils receiving heavy use.

Closing some areas to ORV use should stop the impacts to water resources in those areas where ORV use has been a problem. The effects should gradually taper off to the pre-ORV levels as vegetation and soils recover to natural levels.

Limiting ORV use in the rest of the planning area (seasonal closures, existing roads and trails) should help keep sediment and salt yields at present levels. In the case of limited to designated roads and trails, the limitation may cause sediment and salt yield to decline as the nondesignated roads and trails are revegetated.

Another decrease in sediment and salt yield under this alternative results from livestock grazing management. These changes are either closing areas to livestock grazing or by changing the season of use. Sediment yield due to changes in livestock grazing management may decrease by between 480,200 and 3,959,000 tons per year. Salt yield could decrease by between 4,900 and 69,600 tons per year. A decrease of 24 water developments and 24 miles of fence would be constructed under this alternative compared to alternative A. Sediment yield, therefore, should decrease by between 300 and 2,240 tons per year and salt yield should decrease by between 5 and 38 tons per year. Riparian and aquatic area closures to livestock grazing could decrease sediment by between 6,890 and 62,400 tons per year. Salt yield could decrease by between 50 and 1,030 tons per year.

Less coal activity would take place under this alternative than under alternative A. This should result in a decrease of between 20 and 130 tons per year of sediment and up to 1 ton per year of salt. Less activity would take place on mining claims and assessments which should result in a decrease of between 70 and 560 tons of sediment per year and between 1 and 5 tons of salt per year.

Mineral material operations in close proximity to perennial watercourses could destabilize and alter natural stream channels and disrupt the beneficial values of floodplains. These impacts could result in changes in the water tables and surface water flows and could make floods more destructive.

Although there is a net decrease in sediment and salt yield under this alternative, there could be increases in sediment and salt yield associated with some activities. Estimates of sediment and salt yield are based on the amount of public land in the planning area. Disposal of public lands results in less BLM acreage available to contribute to sediment and salt yield. Retention or acquisition of public lands results in more BLM acreage available to contribute to sediment and salt yield. Sediment and salt could increase due to the retention of public lands disposed of under alternative A or additional acquisitions of land. Land disposal could account for a decrease of between 3,000 and 17,750 tons per year of sediment and between 48 and 315 tons per year of salt over alternative A. Land aquisition could account for an increase of between 20,340 and 131,300 tons per year of sediment and between 303 and 2,260 tons per year of salt.

A 2,000-acre vegetation manipulation would be done in FPU (see Soils), but this would have a negligible effect on water resources.

Other impacts to surface and ground waters would be as described under alternative A. Total sediment loss could be between 2,328,260 and 19,832,330 tons per year, averaging 11,080,295 tons per year by the year 2000. The rate of sediment yield to the Colorado River could decrease by between 577,240 and 4,721,380 tons per year, an average decrease of 2,649,310 tons per year. Total salt yield could be between 23,003 and 348,578 tons per year, averaging 185,791 tons per year by the year 2000. The rate of salt yield to the Colorado River could decrease by between 6,467 and 82,339 tons per year, an average decrease of 44,403 tons per year.

Conclusion

Surface water quality should not degrade as rapidly under alternative C as under alternative A. Total sediment yield per year could be between 2,328,260 and 19,832,330 tons (averaging 11,080,295 tons per year), a decrease of between 577,240 and 4,721,380 tons per year (average decrease of 2,649,310 tons per year). Total salt yield per year could be between 23,003 and 348,570 tons (averaging 185,791 tons per year), a decrease of between 6,467 and 82,339 tons per year (average decrease of 44,403 tons per year) in the planning area.

Ground water quality would probably remain as in alternative A. The level of TDS in milligrams per liter cannot be quantified.

Vegetation

Under this alternative, about 25,699 acres could be disturbed through the year 2000, 28,845 fewer than under alternative A. Disturbance would be short-term on 18,479 acres, long-term on 7,220 acres. In addition, 8,550 acres would be gained from aquisition of state lands within ACEC boundaries.

The decrease in vegetation disturbance from alternative A would result primarily from decreases in ORV disturbance (28,950 fewer acres). This loss of vegetation is short-term. Most short-term losses would be regained within 5 years following reclamation (with a site-specific seed mix) or natural succession. Appendix S presents impact analysis assumptions, and acres of anticipated disturbance were listed by activity in table 54.

The long-term loss from land disposals would increase (150 acres more than under alternative A).

Anticipated changes in ecological condition under alternative C are shown in table 61.

Changes to higher seral stages would result from implementation of existing AMPs and elimination of continual spring grazing. AMPs and elimination of continual spring grazing would allow periodic rest of vegetation to recover from grazing thus producing a higher density of livestock forage, and changes in plant composition, thus resulting in more acres moving to a higher seral stage.

The Bowknot Bend (1,830 acres), North Big Flat Top (190 acres), and San Rafael Reef (43,870 acres) relict vegetation areas would be designated as ACECs under this alternative, whereas no such designations were identified under alternative A. The Hebes Mountain relict vegetation area would not receive special protection under alternative C.

TABLE 61

Anticipated Changes in Ecological Condition, Alternative C

Ecological Condition Class	Ecological Condition by Percent of Resource Area Present (1985)	Future (2000)
Potential Natural Community	9	11
Late Seral	22	22
Mid Seral	47	46
Early Seral	9	8
Rock Outcrop/Badlands	13	13

Threatened or Endangered Plants

There would be no impact to T/E species from controlled activities. T/E plants would be protected from potential ORV impacts on 12,420 acres of the 18,500 acres of T/E plant habitat in the planning area. The plants would also be protected from potential mining disturbance by requiring plans of operation on any mining operations within 1,810 acres of T/E plant habitat. There would be no impact to T/E plants under alternative C.

Conclusion

Short-term vegetation loss would be reduced by 28,995 acres to 18,479 acres. Long-term loss of vegetation would increase by 150 acres to 7,220 acres. In addition, 8,550 acres would be gained through aquisition of state and private lands. Changes to higher seral stages would result. Three relict vegetation areas would receive special protection. There would be no adverse impact to T/E species.

Wild Horses and Burros

Under alternative C, 475,680 acres would be available for wild horse and burro use. There would be some reduction in livestock use to accommodate nonmotorized recreation use and big game management. Desert bighorn sheep are projected to increase to 860 head by the year 2000. In some areas there may be a conflict between wild burros and bighorn sheep. Wild burros apparently graze rather than browse more than bighorn sheep, so some forage made available for big game (by livestock reductions) may be available for the wild burros.

Under this alternative it is considered that wild horses would be maintained at a range of 70 to 100 head and wild burros between 25 and 60 head. By managing for this range of wild burros the conflict with desert bighorn sheep should be reduced. These animals would provide a positive value for nonmotorized recreational users.

Forage required to maintain these animals at the maximum number is 900 AUMs for wild horses and 435 AUMs for wild burros, for a total of 1,345 AUMs.

Conflicts in use between wild equids, livestock and big game would be resolved and adjustments in specific forage use would be made at the activity plan level in conjunction with grazing decisions or at any time deemed necessary as a result of rangeland monitoring.

Conclusion

Wild horses would be maintained at a range of 70 to 100 head and wild burros between 25 and 60 head. Forage requirement for these animals at the maximum number is 1,345 AUMs.

Forage use levels may be adjusted between wild equids, livestock, and big game based on monitoring data.

When the high level of numbers is reached, the wild equids would be reduced to the lower level of numbers.

Wildlife

Desert Bighorn Sheep

Crucial desert bighorn sheep habitat would increase from 150,000 acres to 200,000 acres, about 50,000 acres more than under alternative A. Because of habitat restrictions on other resource uses and activities, the herds would be expected to expand into protected areas. The following are specific habitat changes:

- Seasonal conditions to oil and gas leases on 85,690 acres would protect the desert bighorn sheep habitat.
- Management of six ACECs and ROS classes would keep large tracts of land in relatively undisturbed condition and preserve vegetation used by the sheep for food and cover, increasing crucial habitat by about 30,000 acres and allowing populations to increase by about 300 animals.
- Throughout the habitat area, offsite mitigation would be required if more than 10 acres of habitat were disturbed, so as to replace food and cover lost. Offsite mitigation would increase crucial habitat by 150 acres and result in a gain of about 15 animals.
- Livestock grazing in desert bighorn sheep habitat would be reduced by 2,050 AUMs, providing more forage for the sheep and reducing the potential for disease transmission. This would allow sheep population to increase by about 250 animals.
- ORV use and development activities would be prevented on 335,670 acres of desert bighorn sheep habitat, increasing crucial habitat by 5,000 acres and allowing desert bighorn sheep to increase their numbers by 75.
- The conflict between desert bighorn sheep and wild burros would increase with the increase in wild burros and sheep in this alternative. The acres involved in this conflict would increase from 150 to 58,410 acres of crucial habitat and would reduce the potential increase in sheep numbers by about 380 animals.

The population of desert bighorn sheep would increase from 500 under alternative A to about 860 animals by the year 2000, an increase of 360 animals.

Antelope

Antelope habitat would remain at 507,000 acres, the same as in alternative A. However, a net gain of about 360 animals would result primarily from the following factors:

- Applying protective seasonal conditions to all develpment activities and limiting ORV use to designated roads and trails would reduce stress and improve habitat conditions on about 360,000 acres, allowing an approximate 15 percent increase in the antelope population.
- Assuming that there would be an increase of one antelope for every 40 acres treated under the offsite mitigation requirement, application of the requirement to 660 acres of crucial habitat would result in a gain of about 16 antelope.
- The change in season of livestock use on 504,900 acres of habitat and reduction of livestock AUMs by 1,200 would decrease competition for forage, particularly for spring grasses and forbs, and would result in an increase of 250 antelope.

The population of antelope would increase from 700 to about 1,060 animals by the year 2000. This is 360 animals more than under alternative A.

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Mule Deer and Elk

Crucial winter range habitat would increase from 35,510 acres to 70,000 acres for mule deer and from 18,200 to 28,000 acres for elk (an increase of 34,490 acres for mule deer and 9,800 acres for elk over alternative A).

The increase in mule deer and elk crucial winter habitat would result primarily from the following factors:

- Applying protective seasonal conditions to all development activities and limiting ORV use to designated roads and trails would reduce stress and improve habitat conditions on about 4,880 acres of mule deer habitat and 2,440 acres of elk habitat (until the year 2000). Assuming a 2 percent per acre population increase, there would be a gain of about 430 mule deer and 50 elk.
- Assuming an increase of one deer for every 10 acres and one elk for every 40 acres treated under the offsite mitigation requirement, application of the requirement of 660 acres of crucial habitat would result in a gain of about 60 mule deer and 15 elk;
- The change of season of livestock use on 15,800 acres of mule deer habitat and 16,500 acres of elk habitat and elimination of livestock grazing on 41,690 acres of mule deer winter range and 6,750 acres of elk winter range would decrease competition for winter and spring forage, allowing an increase of 2,500 mule deer and 85 elk.

Populations would increase from 6,620 to 9,200 mule deer (prior stable) and from 600 to 750 elk. This is 2,580 mule deer and 150 elk more than under alternative A.

Riparian and Aquatic Habitat

The area of riparian and aquatic habitat would increase from 14,780 acres to 14,980 acres, an increase of 200 acres from alternative A. Vigor and density of riparian vegetation would improve or increase. The increase in riparian and aquatic habitat would result primarily from the following factors:

- Elimination of losses now occurring on riparian and aquatic habitat by restricting ORVs and development activities to designated roads and trails or excluding from riparian and aquatic areas would allow a 100-acre increase in riparian habitat.
- Livestock exclusions within riparian areas and reduced stocking rates for livestock would allow for complete rest through the growing season and increase riparian and aquatic habitat by 100 acres.

Threatened or Endangered Animals

The bald eagle and peregrine falcon would benefit from the improved managment of riparian habitat with its improved condition and 200-acre increase to a total of 14,980. Uncontrolled activities that have the potential to affect T/E species habitat would be controlled under alternative C. The known peregrine falcon nest and the prairie dog towns that provide potential habitat for black-footed ferrets would be protected from development activities, ORV use and mining claim work under this alternative.

Conclusion

Crucial habitat for desert bighorn sheep would increase to 200,000 acres (50,000 acres more than under alternative A), allowing desert bighorn sheep populations to grow to 860 animals, about 360 more than alternative A.

Although habitat for antelope would remain at 507,000 acres, improved habitat condition would allow antelope populations to grow to 1,060 animals, about 360 more than alternative A.

Crucial winter habitat would increase to 70,000 acres for mule deer and 28,000 acres for elk (increases of 34,490 acres for mule deer and 9,800 acres for elk from alternative A). Mule deer and elk populations would increase to about 9,200 mule deer and 750 elk, about 2,580 more mule deer and 150 more elk than under alternative A.

Riparian and aquatic habitat and related T/E wildlife species habitat would increase to 14,980 acres, a 200-acre increase over alternative A. There would be no adverse impacts to T/E wildlife species under alternative C.

HUMAN USES

Grazing

Grazing would be allowed on 76,640 fewer acres than in alternative A, in a total of 73 allotments (appendix I). Eight allotments would be lost to land disposal and two allotments would be combined for improved management. Under this alternative, Bowknot Bend ACEC (1,830 acres) and North Big Flat Top ACEC (180 acres) would be excluded from livestock grazing. Since these areas are inaccessible to livestock, the exclusion would not represent a decrease in grazing area. Additional areas excluded from grazing would include 16 allotments with crucial deer and elk winter range (52,720 acres) and developed recreation sites (60 acres). An additional 150 acres would be lost to land disposals, for a total of 6,970 acres.

Currently, livestock grazing occurs at approximately the level of the past 5-year average licensed use (56,871 AUMs); operator demand is not equal to the allowable active preference of 88,252 AUMs. It is assumed that operator demand for livestock forage will remain at the 5-year average use level, but may increase to allowable active preference. Therefore, a range is used for analysis purposes.

Livestock AUMs would decrease in this alternative primarily because of potential conflicts between livestock and wildlife (deer, elk, antelope, and bighorn sheep). The 5-year average licensed use could decrease by 10,781 AUMs, and active preference could decrease by 14,784 AUMs. This licensed use would be within the range of 45,380 to 72,758 AUMs, depending upon operator demand.

Spring grazing on 69 allotments would be changed to winter use to protect the P, SPNM, and SPM ROS class areas during times when visitor use is greatest. In areas where forage conflicts could occur in winter, livestock AUMs would be reduced to allow for wildlife (AUMs were reduced by subtracting wildlife AUMs from 5-year average licensed use and active preference AUMs of each allotment). In some allotments with heavy deer and elk use, livestock AUMs would be reduced to zero (appendix I). This would result in a long-term loss of 11,743 5-year average licensed use AUMs and 15,746 active preference AUMs.

Land disposals (160 AUMs more) would account for additional long-term loss of AUMs. The only increase would be from a decrease in disturbance from ORVs (1,447 AUMs). ORV disturbance would cause a short-term vegetation loss, since most vegetation would be regained through natural succession. No additional AUMs would result from the aquisition of state and private lands (35,430 acres) because most of the state land already has exchange-of-use agreements and private lands are minimal.

This alternative would allow implementation of 25 new AMPs, modification and implementation of 7 existing AMPs and the continuation of 6 existing AMPs. These AMPs would be managed to maintain ROS classes and to protect wildlife habitat, particularly crucial deer and elk winter range. The elimination of spring grazing in allotments would allow for increased vigor and density of cool season grasses.

Spring use without periodic rest from grazing would continue on three allotments.

Conclusion

The area available for grazing would decrease to 1,535,480 acres. Livestock forage use could decrease to 76,640 5-year average licensed use AUMs and to 72,758 active preference AUMs. The licensed use would be within the range of 45,380 to 72,758 AUMs, depending upon operator demand.

Forest Product Use

Under alternative C, 1,100 acres would be excluded from collection of wood for campfire use because of relict vegetation and cultural ACECs and developed recreation site restrictions. Designation of private and commercial forest product harvest areas would be excluded on 245,850 acres because of relict vegetation and cultural ACECs, developed recreation sites, ROS classes and riparian and acquatic habitat restrictions. A 2,000-acre vegetation manipulation in FPU would allow these areas to be better utilized for woodland harvest but would not increase the available acreage because it was already available for harvest. While the change in acreage would affect the available supply, adequate area would remain available to meet the demand for dead wood and forest product harvest. The area excluded from campfire use would increase 610 acres over alternative A, while the area excluded from private and commercial use would be 230,240 more than alternative A.

The area used for harvest of woodland products and 2,000 acres of vegetation manipulation would affect less than 1 percent of the 451,270 forested acres.

Conclusion

As in alternative A, based on past use and present harvest, an adequate supply of dead wood and live forest products would be available on 205,410 acres, a decrease of 230,250 acres from alternative A through the year 2000.

Cultural Resources

Under alternative C, about 6,060 of the estimated 70,000 cultural resources would be damaged or destroyed, a decrease of 675 from alternative A. This decrease in sites damaged or destroyed would result from fewer areas being affected by ORV use, grazing, and mineral activities.

The number of cultural resources available for use would decrease to 2,477, 12 fewer than under alternative A. This decrease would result from reductions in required inventories.

Conclusion

About 6,060 cultural resources would be damaged or destroyed under alternative C. The number of cultural resources available for use would decrease to 2,477.

Recreation

Alternative C would increase primitive and semiprimitive recreation opportunities, while decreasing ORV-user access and opportunities for cross-country travel. The P class would total 114,220 acres, an increase 44,540 acres from alternative A; the SPNM class would total 231,140 acres, an increase of 47,730 acres; the SPM class would total 603,400 acres, a decrease of 59,470 acres; the RN class would total of 581,420 acres, a decrease of 25,300 acres; and the R class would total 10,500 acres, a decrease of 170 acres from alternative A. The U class (20 acres) would not change.

The increased demand for nonmotorized activities would probably be accommodated in existing settings; however, management actions to encourage dispersed use could be required in a few areas. Commercial visitation would increase under alternative C because natural and scenic values associated with commercial recreation ventures would be preserved.

A large increase in wildlife numbers under alternative C would result in a beneficial secondary impact to recreation by increasing wildlife viewing hunting opportunities.

Cross-country ORV recreation use would be constrained under alternative C; however, scenic values important to ORV recreationists would be protected. Only 194,640 acres would be open to ORV use, decreasing access and opportunities for cross-country travel. ORV use would be limited by seasonal restrictions on 246,700 acres to protect mule deer, elk, desert bighorn sheep, and antelope. ORVs would be limited to designated roads and trails on 606,110 acres to protect riparian and aquatic habitat, SPM class areas, and developed recreation sites. The remaining 491,740 acres would be closed to protect P and SPNM class areas and ACECs. Limiting and closing these areas would help to retain the nonmotorized settings and focus management attention on recreation use, maintaining natural, scenic, and cultural values.

The development and expansion of recreation facilities would help to meet the increased demand for motorized and nonmotorized recreation. Recreation sites would be developed or expanded at the San Rafael Campground, Justensen Flats, Tomsich Butte, the Wedge, and Swasey Cabin, reducing user conflicts, human waste, and trash.

Adjustments in the season of use for livestock (eliminating spring and fall use) and overall reduction of livestock numbers would increase the quality of the recreation experience.

Management objectives would help assure the retention of unusual recreation opportunities and scenic values identified in the wild and scenic rivers eligibility and potential classification study (appendix J) for the majority of the San Rafael River, the lower portion of Labyrinth Canyon (Green River), and Muddy Creek.

Conclusion

Compared to alternative A, alternative C would shift the ROS class acreages toward the resource-dependent (primitive) end of the spectrum, increasing the acreage available for activities in undeveloped settings and decreasing ORV access and opportunities for cross-country exploration. The P class would increase to 114,220 acres; the SPNM class would increase to 231,140 acres; the SPM class would decrease to 603,400 acres; the RN class would decrease to 581,420 acres; and the R class would decrease to 10,500 acres. The U class (20 acres) would not change.

Areas open to ORV use would decrease to 194,640 acres, reducing access and opportunities for cross-country travel. Areas limited by seasonal restrictions would increase to 246,700 acres; areas limited to designated roads and trails would increase to 606,110 acres; and areas closed to ORV use would increase to 491,740 acres.

Visual Resources

Alternative C would place 472,130 acres in VRM class I (all increase from alternative A). The increase includes all P and SPNM ROS class areas (401,950 acres total), and Bowknot Bend, North Big Flat Top, I-70 Scenic Corridor, Gilson Buttes, Muddy Creek, San Rafael Canyon, San Rafael Reef, Segers Hole, and Sids Mountain ACECs (some overlap with P and SPNM class areas).

VRM class II acreage would increase to 725,940 acres (an increase of 229,570 acres over alternative A). The increase includes SPM class areas (603,400 acres).

Other VRM class areas would remain the same as under alternative A, except where acreage was shifted into classes I and II. Class III would decrease 216,420 acres to 166,850 acres, and class IV would decrease 485,280 acres to 174,270 acres.

It is projected that by the year 2000, in 106 cases, visual contrast rating scores would exceed the VRM class objectives for that area (a decrease of 14 from alternative A).

Conclusion

The area in VRM class I would increase to 472,130 acres (all increase over alternative A); VRM class II acreage would increase to 725,940 acres. The area in other VRM classes would decrease a corresponding amount: class III would decrease to 166,850 acres; and class IV would decrease to 174,270 acres. In 106 cases, visual contrast rating scores would exceed the VRM class objectives.

Lands

Under alternative C, no right-of-way corridors would be designated (no change from alternative A). Lands available (standard conditions) for rights-of-way would total 193,710 acres (181,450 in SRRA (a decrease of 1,231,500 acres)) and 12,260 in FPU (a decrease of 60,390 acres). A total of 872,660 acres would be avoided (812,270 in SRRA (an increase of 761,380) and 60,390 in FPU (an increase of 57,690)). Exclusion areas would total 472,820 acres (470,120 in SRRA (all increase) and 2,700 in FPU (all increase)).

A total of 6,970 acres would be managed for disposal (6,140 in SRRA (an increase of 360 acres) and 830 in FPU (a decrease of 210 acres)); there would be a net increase of 150 acres in lands managed for disposal over alternative A.

The amount of land withdrawn from entry would total 474,600 acres (471,900 acres in SRRA (an increase of 470,120 acres over alternative A) and 2,700 acres in FPU (all increase)). Withdrawn areas would include the Bowknot Bend, Tomsich Butte, Gilson Buttes, I-70 Scenic Corridor, Muddy Creek, San Rafael Canyon, San Rafael Reef, Pictographs, Segers Hole, and Sids Mountain ACECs, developed recreation sites, and P and SPNM ROS class areas.

State lands within the I-70 Scenic Corridor ACEC are identified for possible acquisition under alternative C. These areas would total 8,580 acres (7,160 in SRRA and 1,420 in FPU, all increase over alternative A). Actual acreages acquired may be adjusted for ease of management.

Conclusion

No right-of-way corridors would be designated (no change). Lands available (standard conditions) for rights-of-way would total 193,710 acres. A total of 872,660 acres would be avoided. Exclusion areas would total 472,820 acres.

A total of 6,970 acres would be managed for disposal.

The amount of land withdrawn from entry would total 474,600 acres.

State lands identified for possible acquisition would total 8,580 acres. Actual acreages acquired may be adjusted for ease of management.

ECONOMIC CONSIDERATIONS

Minerals

The proposed special conditions, and no surface occupancy would increase the cost and lower the output value of mineral exploration and development over alternative A by (1) changing the location, method, or equipment used in mineral exploration and development; (2) increasing the amount of coordination required with the BLM; (3) temporarily idling labor and equipment; (4) lengthening the duration of mineral exploration and development; and (5) delaying production and hence delaying receipt of revenues.

The effect on mineral exploration and development would vary by type and location of stipulation and special condition. Appendix Q describes the mineral potentials by type of special condition for locatable and leasable minerals.

The area covered by special conditions would increase 780,890 acres, a 1,172 percent increase relative to alternative A.

Exploration techniques required in no-surface-occupancy areas can be four times more expensive than standard techniques, and sometimes yield poorer quality data, which can reduce drilling success rates and decrease production. The no-surface-occupancy stipulation would not affect exploration costs in areas where access is poor and special techniques such as directional drilling would be used regardless of management. However, under standard conditions, directional drilling and production cost about 20 to 30 percent more than standard drilling and production. The added production costs would also render production uneconomical at an earlier date, and thereby decrease total production. Current economics and technology restricts slant drilling in the area to less than 1 horizontal mile from the drill site. Areas further away would essentially be closed to production.

The special condition in SPM class areas requiring revegetation to blend with surrounding conditions within 1 year would essentially eliminate mineral activity in some vegetation communities, and would increase reclamation cost by over 20 percent in other areas.

With effective coordination of manpower and equipment, seasonal special conditions would not add to activity cost. However, the seasonal conditions could be costly (more than a 1 percent cost increase) if they idle equipment and labor. Seasonal conditions could also force demobilizing and remobilizing equipment when an exploratory well is followed up with development wells, adding more than 5 percent to development cost. This has rarely been a problem with existing seasonal stipulations.

Oil and gas drilling costs would increase an average of 1 percent where big game offsite mitigation would be required. Other stipulations and special conditions would have little or no effect on oil and gas activity.

Locatable mineral exploration and development which disturbs less than 5 acres and is not within an ACEC or an area of restricted ORV use would not be affected by special conditions. Special conditions would be required to the extent possible without rendering the activity uneconomic. Many of the more stringent conditions could not be enforced. On the average, these more stringent requirements would increase reclamation costs by over 20 percent and total activity costs by less than 5 percent.

The proposed special conditions would either increase the cost of developing mineral materials or cause the development to be relocated to a site farther away from the point of use. The I-70 corridor exclusion would have the greatest affect on developing and stockpiling of mineral materials. Increased two-way hauling distances would average 5 miles, adding an average $2.50 per cubic yard, or approximately 25 percent, to the cost of getting mineral materials to the point of use. Other special conditions and exclusions would not be located in areas with a demand for developing and stockpiling of mineral materials.

Under this alternative there would be a much larger area where, because of special conditions, mineral exploration and/or development would be more costly. Much of these increased exploration and development costs would be spent in the local economy, thereby increasing local employment and earnings. However, the increased costs would also decrease the amount of mineral activity, thereby decreasing local employment and earnings. The net effect on the local economy cannot be quantified

The large increased acreage where mineral activities would be excluded, either outright or by special conditions so stringent that mineral activities cannot comply, would result in a net decrease in economic activity. The resulting local employment and earnings decrease cannot be projected.

Based on the assumed decrease in oil and gas activity, and locatable mineral exploration and development, it is estimated that mineral-related employment, earnings, and taxing district revenues would decrease as follows.

		Total	Change from Alternative A
Emery County	Employment (jobs)	359	-1
	Earnings ($)	1,007,430	-18,800
	Revenue ($)	14,500	-1,800
Carbon-Emery County	Employment (jobs)	566	-2
	Earnings ($)	12,445,200	-24,400
	Revenue ($)	568,300	-3,000

Soil and Water

Sediment yield resulting from the surface disturbance projected under this alternative would decrease annual damage to downstream capital investments by $46,500 to $381,700 over alternative A. Salt loading resulting from the surface disturbance projected under this alternative would decrease annual damage to water users in the lower Colorado River basin by $427,700 to $5,197,800 over alternative A.

Livestock Grazing

Altogether, 6 operators would have more forage, 112 would have less, and 21 operators would not be affected. (Forage losses and gains under the alternatives are explained in the Grazing sections of this chapter.) Changes in available forage would change rancher income by affecting herd size, weight gain, calf survival rates, or operating costs.

The number of operators affected, the degree of impact, and the related effects on local employment and earnings are presented in tables 62 and 63.

The spring (April and May) livestock exclusions would affect 120 of the 139 livestock operators. Most operators would have few options with which to respond to these exclusions. They would have to either purchase feed to replace the lost forage, shift to forage that is normally used during other months, or reduce herd sizes so that the forage produced from base properties would last longer.

Replacing forage lost through spring exclusions with hay would represent a worst-case analysis Feeding hay during the spring may adversely affect livestock weight gains and reduce gross revenues. If the feeding were to be done on alfalfa-producing property during the spring, alfalfa yields could be affected, and bloating problems could arise. The analysis assumes that operators would respond to the spring exclusions by feeding hay.

The combined affect of spring exclusions and changes in available forage would reduce operator returns above variable cost by $556,500, a 61 percent decrease.

Based on the direct effects from the budget analysis and on the indirect and induced effects derived from a county economic model, it is estimated that local employment, earnings, and taxing district revenues would decrease as shown here.

TABLE 62

Number and Degree of Livestock Operator Impacts, Alternative C

	Operators with an Increase from Existing Use and Net Revenues			Operators Not Affected	Operators with a Decrease from Existing Use and Net Revenues		
	Over 51%	11 to 50%	1 to 10%		1 to 10%	11 to 50%	Over 51%
Public rangeland forage	0	5	1	21	22	47	44
Total feed requirements	0	2	4	21	69	42	1
Operator returns above variable costs	0	1	0	1	21	77	39

TABLE 63

Aggregate Economic Impacts to Livestock Operators, Alternative C

Livestock Operators	Baseline Situation	Alternative C
Gross Revenue	$2,920,700	$2,357,000
Total Variable Cost	2,008,400	2,001,300
Returns Above Variable Cost	912,200	355,700
Returns to Labor and Investment[a]	158,000	-267,800
Livestock Numbers (animals)	9,206	7,315
Hired Labor (jobs)	3,761	2,864
Total Earnings, Emery County	$459,500	$365,900
Total Employment, Emery County (jobs)	156	124
Total Earnings, Carbon-Emery County	1,103,900	879,100
Total Employment, Carbon-Emery County	242	192

NOTE: These budgets assume that ranchers have no long-term outstanding debt, that all operating capital is borrowed, and that existing ranchers would not go out of business.

[a] Returns net of variable and fixed costs to management, non-hired labor, machinery, equipment, and land.

		Total	Change from Alternative A
Emery County	Employment (jobs)	124	-32
	Earnings ($)	365,900	-93,500
	Revenue ($)	254,300	-65,000
Carbon-Emery County	Employment (jobs)	193	-49
	Earnings ($)	879,100	-224,700
	Revenue ($)	578,500	-147,900

Any grazing permit change could affect ranch value and therefore operator wealth, particularly if the changes affect the ranch's total carrying capacity. The decrease in available forage would decrease aggregate operator wealth by $539,000, a 2.1 percent decrease.

Lending institutions base loans on a number of factors, including the rancher's ability to repay the loan. The repayment ability is usually measured by the rancher's likely future income with the loan. Because aggregate rancher income is expected to increase under this alternative, ranchers' abilities to repay loans should likewise increase.

Base properties are used as collateral for some types of loans. Since base property values are either not affected or projected to increase under this alternative, the level of total indebtedness allowed should increase.

The analysis accounts for those projects that either would not be allowed or would be abandoned due to stipulations and special conditions. Some stipulations and special conditions, such as those that limit ORV use or require projects to blend with the natural environment, would not prevent livestock use and rangeland projects, but would increase their cost.

The limitations on range improvements may increase the cost of maintaining and replacing range improvements. These limitations cannot render existing improvements uneconomic to maintain or replace; however these limitations may prevent new improvements from being installed by either outright exclusions or by rendering the projects uneconomic through special conditions.

Recreation

Recreation use of the planning area and its related local importance is projected to increase as described in alternative A. The relative mix of uses may change because of changes in recreational opportunities from alternative A (see impacts to recreation). The large area closed to recreational cross county ORV travel could reduce total ORV use of the area. The local economic effect of this decrease in ORV use and changing mix of opportunity settings is unknown. However, judging from the existing economic importance of recreation in the planning area (less than 0.1 percent of local employment and earnings), these changes would have little effect on the local economic conditions.

Existing commercial outfitters rely heavily on the P, SPNM, and SPM opportunity settings available in the planning area. The 36 percent gain of P and SPNM, opportunity settings from alternative A could increase the demand for outfitter services in these areas. The 9 percent loss of SPM opportunity settings could decrease the demand for outfitter services in these areas. Because projected demand for commercial services is small and would comprise a small portion of any outfitter's business, these changes in opportunity settings would have little economic effect. The additional developed recreation sites should have little to no effect on use and related local expenditures. The services offered should not compete with, and therefore not affect, privately owned recreation developments or commercial outfitters.

There is no known relationship between special management designations and recreation use. Publicity following designation could increase public awareness of these lesser known areas, and therefore increase visitation and related local expenditures. Even if visitation to these special designation areas were doubled, the local economic effect would be insignificant. This effect, however, could be significant to outfitters who might use these areas.

Desert bighorn sheep, antelope, deer, and elk populations are projected to increase from alternative A. Assuming that population/harvest, harvest/hunter, and population/primary nonconsumptive use ratios remain constant, projected wildlife use and related expenditures would bring the following increases.

		Total	Change from Alternative A
Emery County	Employment (jobs)	28	+9
	Earnings ($)	251,700	+77,400
	Revenue ($)	38,600	+11,800
Carbon-Emery County	Employment (jobs)	76	+23
	Earnings ($)	1,018,700	+313,300
	Revenue ($)	61,100	+18,800

Other Land Uses

Special conditions, the no-surface-occupancy stipulation, areas closed to resource use or production would affect other land uses in much the same way as they affect mineral activities. Some activities within areas of restricted ORV use would require additional coordination with BLM through a lands action which would not otherwise be required. Much of the increased costs associated with activities in special-condition and no-surface-occupancy zones would be spent in the local economy, thereby increasing local employment and earnings. However, the increased costs would also decrease the amount of other land use activity, thereby decreasing local employment and earnings. The net effect on the local economy cannot be quantified

The proposed land disposals would be widely scattered through Castle Valley and would represent a 0.1 percent increase from the private land base relative to alternative A. This increase in private land base would not affect nearby land values, but would increase local taxing district revenues by at least $150 from alternative A.

The large area avoided and excluded from major utility lines could force the relocation of new facilities, thereby increasing their cost.

Plan Budget

The 30 percent increased budget over alternative A needed to implement this alternative would bring the following increases.

		Total	Change from Alternative A
Emery County	Employment (jobs)	12	+3
	Earnings ($)	137,500	+31,700
	Revenue ($)	3,100	+709
Carbon-Emery County	Employment (jobs)	47	+11
	Earnings ($)	885,400	+204,600
	Revenue ($)	24,700	+5,700

Conclusion

Mineral-related local employment, earnings, and taxing district revenues are projected to decrease. Sediment- and salinity-related costs would decrease. Livestock operator returns above variable costs, ranch value, and associated local employment, earnings, and taxing district revenues would decrease. The aggregate increase of P, SPNM, and SPM acreage could increase the demand for commercial outfitter services in the area, although this effect would be insignificant. Wildlife-related local employment, earnings, and taxing district revenues would increase. Increased management restrictions would increase the cost of land disturbing activities in some areas, but the net effect on the economy is unknown. The land disposals would increase taxing district revenues in Emery County. The large area avoided and excluded from major utility lines could increase their construction cost. The increased budget needed to implement this alternative would increase local employment, earnings, and taxing district revenues.

SOCIAL CONDITIONS

None of the management actions would impact local communities so far as to noticeably affect their social conditions. A number of livestock operators would be significantly affected. Some operators may be forced to seek a second job, and operators who are forced to sell their operations would have to change their way of life entirely. Some ranchers do not have the training and skills to enter new job markets.

Conclusion

Social conditions of nearby communities would not be affected. The lifestyles of some ranchers would change.

ALTERNATIVE D

MINERAL COMPONENTS

Oil and Gas

Under alternative D, establishment of scenic ACECs and closure of critical watershed and riparian habitat areas and R&PP leases to leasing would reduce the area open to lease by 1,160,160 acres compared to alternative A. This decrease would cause a decrease in production from that described in alternative A, as the closed areas have high, moderate, and low potential for oil and gas (appendix Q). Leasing category acreages under alternative D compare as follows to those under alternative A.

Category	Unit	Acres	Change from Alternative A
1	SRRA	168,510	-961,770
	FPU	3,820	-47,950
	Subtotal	172,330	-1,009,720
2	SRRA	77,990	+34,860
	FPU	7,600	-10,670
	Subtotal	85,590	+24,190
3	SRRA	0	-169,320
	FPU	0	-5,310
	Subtotal	0	-174,630
4	SRRA	1,217,340	+1,096,230
	FPU	63,930	+63,930
	Subtotal	1,281,270	+1,160,160

The increase in category 2 acreage results from addition of seasonal restrictions to protect R&PP leases and habitat for wildlife such as desert bighorn sheep, elk, mule deer, and antelope. These restrictions would increase operating and production expenses, but are not expected to affect production. The category 2 area has high, moderate, and low potential for oil and gas.

Category 4 areas would include critical watersheds, aquatic and riparian habitat, P and SPNM ROS class areas, and ACECs. Because these occur in areas with high, moderate, and low oil and gas potential, the annual production rate for oil and gas would be reduced.

Because of the amount of area closed to leasing under alternative D, the average annual rate of oil and gas production would decrease to 1,500 barrels of oil (a decrease of 5,100 barrels per year) and 169,000 MCF of natural gas (a decrease of 255,000 MCF per year). Production at year 2000 is expected to be 3,000 barrels of oil and 244,000 MCF of natural gas.

In most of the planning area, project conditions would be imposed on geophysical operations which would reduce the miles of seismic line to 25 miles per year (a decrease of 75 miles per year).

Conclusion

The area open to lease would decrease by 1,160,160 acres, to 172,330 acres in category 1; 85,590 acres in category 2; and no acres in category 3. The area in category 4 (no leasing) would increase to 1,281,270. Production rates would be reduced to 3,000 barrels of petroleum and 244,000 MCF of natural gas at year 2000. The number of miles of seismic line would be reduced from 100 miles per year to 25 miles per year.

Coal

Under alternative D, 18,470 acres would be available for coal exploration (15,930 acres in SRRA, and 2,540 in FPU), a decrease of 39,840 acres from alternative A. This equals a 60 percent reduction from alternative A in the amount of land available for exploration. It is estimated that two fewer drill holes would be drilled per year.

Alternative D would close to coal leasing 43,820 acres (17,790 in SRRA, and 26,030 in FPU), leaving 14,370 acres (11,830 in SRRA, and 2,540 in FPU) available for coal leasing. These closures to leasing are not expected to affect coal production by the year 2000, since all production would come from existing leases. However, continued production from existing leases at present levels would exhaust the currently leased coal reserves by the year 2010. Actions under alternative D would effectively withdraw an estimated 400 million tons of coal (60 percent of the Emery Coal Field's available resources).

Conclusion

Under alternative D, 18,470 acres would be available for exploration (39,840 fewer than under alternative A), and 14,370 acres would be available for leasing (43,820 fewer acres than under alternative A). The acreage reductions would not affect coal production (150,000 tons per year).

Mineral Materials

Under alternative D, 246,500 acres would be open to mineral material disposal in SRRA (a decrease of 1,217,340 acres) and 11,420 would be open in FPU (a decrease of 63,930 acres), for a total of 257,920 acres open in the planning area (a decrease of 1,281,270 acres) (appendix Q). Reductions in the area open to mineral material disposal would be due to critical watershed designations and protection of SPNM ROS class areas. These reductions would cause production to drop as free use permits in closed areas expired and could not be renewed. Production would average 80,000 cubic yards per year, rising until 1992 and then beginning to decrease in 1994, leveling off in 1999 at 50,000 cubic yards per year, 270,000 less than alternative A.

Conclusion

The area open to mineral material disposal would decrease to 257,920 acres. The average annual production rate would decrease to 50,000 cubic yards at year 2000.

Locatable Minerals

Under alternative D, 245,700 acres would be open to entry in SRRA (a decrease of 1,216,360 acres from alternative A) and 11,420 acres would be open in FPU (a decrease of 63,930 acres from alternative A), for a total of 257,120 acres open in the planning area (a decrease of 1,280,290 acres from alternative A). In SRRA, 328,150 acres with high potential for uranium would be withdrawn from mineral entry, and 6,710 acres in FPU with high potential for uranium would be withdrawn, for a total of 334,860 withdrawn acres of high potential in the planning area. The remainder of the withdrawn area falls into moderate, low, and no potential areas. Of the areas with high and moderate potential for gypsum, 669,010 acres in SRRA would be withdrawn from entry, along with 17,860 acres in FPU, for a total of 686,870 acres in the planning area. The remainder of the area withdrawn would be in areas of low to no gypsum potential (appendix Q). ACECs, critical watershed, riparian and aquatic habitats, and ROS class SPNM make up the area withdrawn from entry.

In alternative D, standard conditions would be applied to areas open to leasing. Special conditions would not be applied. Closure of a large part of the planning unit would decrease exploration and development work. If 1,420 acres identified for land disposal are sold, the area open to mineral entry would be reduced.

Conclusion

The area open to mining claim location would decrease to 257,120 acres.

BIOTIC COMPONENTS

Soils

Under alternative D, there should be a decrease in soil loss from alternative A because decreases in soil loss resulting from ORV use designations, changes in livestock management, and mineral activities would be greater than increases resulting from lands actions.

ORV use designations as discussed in alternatives A and C may cause an estimated decrease of between 368,750 and 2,790,000 tons per year of soil loss.

Another decrease in soil loss under this alternative may be due to changes in livestock grazing management. These changes are either closing areas to livestock grazing or changing the season of use. Soil loss due to livestock changes could decrease by between 1,227,250 and 10,255,000 tons per year. Soil loss due to surface-disturbing activities associated with livestock related range improvements could decrease by between 750 and 5,600 tons per year. Closure of riparian and aquatic areas to livestock grazing could decrease soil loss by between 16,420 and 149,400 tons per year in either area.

A decrease of between 5,100 and 38,500 tons per year of soil loss could occur because of a decrease in the surface-disturbing activities associated with oil and gas and geophysical activities. Accidental fluid discharges during oil and gas drilling operations could contaminate soils. A decrease of between 50 and 360 tons per year could be expected due to the decrease in surface-disturbing activities associated with coal. A decrease of between 1,500 and 11,180 tons per year of soil may be expected from the decrease in mineral material activities. A decrease in soil loss of between 180 and 1,400 tons per year may be expected due to the decrease in mining claims and assessment work. Fewer rights-of-way would be issued, which could decrease soil loss by between 400 and 3,000 tons per year.

Although there would be a net decrease in soil loss under this alternative, there could be an increase in soil loss associated with some activities. Soil loss may increase because public lands retained would be disposed of under alternative A or because of land acquisition that would not have occurred under alternative A. Estimates of soil loss are based on the amount of public land in the planning area. Retention or acquisition of public lands results in more BLM acreage available to contribute to total soil loss. Soil loss may increase due to the retention of public lands disposed of under alternative A. This could account for an addition of between 20,780 and 163,280 tons per year. Land acquisition could account for an increase in soil loss of between 8,100 and 90,000 tons per year.

A 2,000-acre vegetation manipulation would be done in FPU. The value of land treatments such as chainings in reducing erosion and sediment yield is not clear. Long-term effects appear to be beneficial, not only for increasing ground cover (which stabilizes soils), but also for improving rilling and gullying on the soil types that would be treated in the resource area. Short-term losses occur from nearly any treatment technique but this would be balanced out by the improvement in cover over the long term [Hansen, 1986].

The soil losses contributed by other factors would continue to be as described under alternative A. Therefore, total soil loss could be between 5,672,220 and 48,383,140 tons per year (averaging 27,027,680 tons per year) by the year 2000. The decrease in soil losses from all causes could be between 1,591,530 and 13,001,170 tons per year (average decrease of 7,296,350 tons per year).

Conclusion

Total soil loss per year could be between 5,672,220 and 48,383,140 tons (averaging 27,027,680 tons per year).

Water

Surface water quality should improve under alternative D compared to alternative A. The improvement would correspond to the decreased rate of soil loss compared to alternative A (see Soils). Decreases in sediment and salt yield resulting from ORV use designations, changes in livestock management and minerals activities would be greater than increases resulting from lands actions.

ORV use designations as discussed under alternatives A and C may cause an estimated decrease of between 147,500 and 1,116,000 tons per year of sediment and between 2,432 and 18,740 tons per year of salt.

Another decrease in sediment and salt yield under this alternative could be due to changes in livestock grazing management. These changes are either closing some areas completely to livestock grazing or changing the season of use. Sediment yield due to changes in livestock grazing may decrease by between 490,900 and 4,102,000 tons per year. Salt yield may decrease by between 4,920 and 72,100 tons per year. Construction of 24 fewer water developments and 24 fewer miles of fence would take place under this alternative than under alternative A. Thus, sediment yield should decrease by between 300 and 2,240 tons per year and salt yield should decrease by between 5 and 35 tons per year. Closures of riparian and aquatic habitat to livestock grazing could decrease sediment by between 6,570 and 59,760 tons per year and decrease salt yield by between 56 and 980 tons per year.

Less oil and gas and geophysical activity would take place under this alternative than under alternative A. This could account for a decrease in sediment of between 2,040 and 15,400 tons per year and a decrease in salt of between 25 and 150 tons per year.

Less coal activity would take place, which could result in a decrease of between 20 and 150 tons per year of sediment and about 1 ton per year of salt.

Less surface-disturbing activity would take place due to mineral material disposal. Sediment could decrease by between 600 and 4,470 tons per year and salt could decrease by between 7 and 43 tons per year. Fewer mining claims and less assessment work would take place, which could result in a decrease in sediment yield of between 70 and 560 tons per year and a decrease in salt yield of between 1 and 5 tons per year.

Mineral material operations in close proximity to perennial watercourses could destabilize and alter natural stream channels and disrupt the beneficial values of floodplains. These impacts could result in changes in the water tables and surface water flows and could make floods more destructive.

Fewer rights-of-way would be issued which could decrease sediment by between 160 and 1,200 tons per year and decrease salt yield by between 2 and 12 tons per year.

Although there would be a net decrease in sediment and salt yield under this alternative, there could be increases in sediment and salt yield associated with some activities. Estimates of sediment and salt yield are based on the amount of public land in the planning area. Retention or acquisition of public lands results in more BLM acreage available to contribute to sediment and salt yield. Sediment and salt yield may increase due to the retention of public lands disposed of under alternative A. This could account for an increase in sediment of between 8,310 and 65,310 tons per year. Salt yield could increase by between 2 and 1,149 tons per year. Land acquisition could account for an increase of between 3,240 and 36,000 tons per year of sediment. Salt yield could also increase by between 10 and 636 tons per year.

A 2,000-acre vegetation manipulation would be done in FPU (see Soils) but this would have a short-term negligible effect on the water resources.

Other impacts to surface and ground waters would be as described under alternative A.

Total sediment yield per year could be between 2,268,890 and 19,353,240 tons per year (averaging 10,811,065 tons per year) by the year 2000. The rate of sediment yield to the Colorado River should decrease by between 636,610 and 5,200,470 tons per year (average decrease of 2,918,540 tons per year). Total salt yield could be between 22,034 and 340,636 tons per year (averaging 181,335 tons per year) by the year 2000. The rate of salt yield to the Colorado River should decrease by between 7,436 and 90,281 tons per year (an average decrease of 48,859 tons per year).

Ground water quality would probably remain the same. The level of TDS in milligrams per liter cannot be quantified.

Conclusion

Surface water quality should improve under alternative D over alternative A. Total sediment yield could be between 2,268,890 and 19,353,240 tons per year (averaging 10,811,065 tons per year), a decrease of between 636,610 and 5,200,470 tons per year (average decrease of 2,918,540 tons per year) from alternative A. Total salt yield could be between 22,034 and 340,636 tons per year (averaging 181,335 tons per year), a decrease of between 7,436 and 90,281 tons per year (an average decrease of 48,859 tons per year) from alternative A.

Vegetation

Under this alternative, a total of 8,416 acres of vegetation could be disturbed (short-term disturbance on 6,746 acres and long-term disturbance on 1,670 acres). This would be 46,128 fewer acres than under alternative A.

The decrease in vegetation disturbance would result primarily from fewer acres of land disposal (5,400 fewer acres). Short-term vegetation disturbance from ORV use would decrease by 39,870 acres. Most of this vegetation loss would be regained within a 5-year period through reclamation (with a site specific seed mix) and natural succession. Appendix S presents vegetation impact analysis assumptions, and acres of anticipated disturbance were listed by activity in table 54.

An additional 2,400 acres of vegetation would be gained through aquisition of state lands within ACECs.

Anticipated changes in ecological condition under alternative D are shown in table 64.

Changes to higher seral stages would result from implementation of existing AMPs and elimination of continual spring grazing. AMPs and elimination of continual spring grazing would allow periodic rest of vegetation to recover from grazing, thus producing a higher density of livestock forage, and changes in plant composition, thus resulting in more acres moving to a higher seral stage.

TABLE 64

Anticipated Changes in Ecological Condition, Alternative D

Ecological Condition Class	Ecological Condition by Percent of Resource Area	
	Present (1985)	Future (2000)
Potential Natural Community	9	13
Late Seral	22	22
Mid Seral	47	45
Early Seral	9	7
Rock Outcrop/Badlands	13	13

The Bowknot Bend (1,830 acres), North Big Flat Top (190 acres), San Rafael Reef (43,870 acres), and Hebes Mountain (960 acres) relict vegetation areas would be designated as ACECs and would receive special protection under alternative D. No such designations were identified under alternative A.

Threatened or Endangered Plants

There would be no impact to T/E species from controlled activities. T/E plants would be protected from potential ORV impacts on 14,170 acres of the 18,500 acres of T/E plant habitat in the planning area. The plants would also be protected from potential mining disturbance by requiring plans of operation on any mining operations within 2,120 acres of T/E plant habitat. There would be no impact to T/E plants under alternative C.

Conclusion

Short-term vegetation loss would decrease to 6,746 acres. Long-term vegetation loss would decrease to 1,670 acres. An additional 2,400 acres would be gained through acquisition of state lands. Changes to higher seral stages would result. All relict vegetation areas would receive special protection. There would be no adverse impact to T/E species.

Wild Horses and Burros

Under alternative D, the area available for wild horses and burros would remain the same as alternative A, which is 475,680 acres. Because of the need to protect the critical soils, wild horse numbers would range between 90 and 115 head and wild burros between 50 and 70 head.

Forage requirements for the wild equids and livestock would be resolved and adjustments in specific forage use would be made at the activity plan level in conjunction with grazing decisions or at any time deemed necessary as a result of rangeland monitoring.

Conclusion

The forage required to maintain the wild equids at the upper limit of the numbers would be 1,540 AUMs. When the equids reach the upper limits of numbers, they would be reduced to the lower limits.

Forage use levels may be adjusted for wild equids and livestock based on monitoring data.

Wildlife

Desert Bighorn Sheep

Crucial habitat for desert bighorn sheep would increase to 175,000 acres. This is 25,000 acres over alternative A. This expansion would result from offsite mitigation and restriction of other activities that impact the sheep. The following are specific changes to the sheep habitat.

- Seasonal conditions applied to oil and gas leases on desert bighorn sheep habitat would also protect the crucial habitat area.
- Throughout the habitat area, offsite mitigation would be required if more than 10 acres of crucial habitat were disturbed, so as to replace food and cover lost. Offsite mitigation would increase crucial habitat by 77 acres to support an additional eight animals.
- Livestock grazing (5-year average licensed use) in desert bighorn sheep habitat would be reduced by 4,518 AUMs, making more forage available for sheep and reducing the potential of disease transmission. This would allow the sheep to increase by about 300 animals, and increase crucial habitat by 17,000 acres.
- ORV use and development activities would be prevented on 373,560 acres of desert bighorn sheep habitat and limited to designated roads and trails on 40,330 acres of desert bighorn sheep habitat. This would allow the desert bighorn sheep to increase their numbers by 82 (16 percent) and increase their crucial habitat by 8,000 acres;
- The conflict between desert bighorn sheep and wild burros would increase with the increased sheep in this alternative. The acres involved in this conflict would increase from 150 to 29,200 acres of crucial habitat and would reduce the potential increase in sheep numbers by about 140 animals.
- Wildlife developments would be restricted on 156,350 acres of critical watersheds to those needed to better distribute the desert bighorn sheep. These would reduce the rate of increase for these animals by about 1 percent.

The population of desert bighorn sheep would increase from 500 to about 750 animals by the year 2000. This is an increase of 250 from alternative A.

Antelope

All of the antelope habitat would remain available (507,000 acres). Antelope populations would increase, primarily because of the following factors:

- Livestock grazing in the habitat areas within critical watersheds would be eliminated from spring grazing (approximately 329,100 acres) and their AUMs reduced 50 percent (reduction of 17,260 AUMs active use or 10,064 AUMS 5-year average use). These AUMs would be available to antelope. The antelope would increase about 250 animals by the year 2000;
- Wildlife developments would be restricted on 329,100 acres of critical watershed to those needed to better distribute the antelope. This would reduce the rate of increase for the antelope by about 8 percent (50 animals by the year 2000);
- Applying protective seasonal conditions to all development activities and closing 287,720 acres of antelope habitat to ORV use would reduce stress and improve habitat conditions, allowing the population to increase by 100 animals.

The pronghorn antelope population would increase from 700 to about 1,000 animals, about 300 more than alternative A.

Mule Deer and Elk

The crucial habitat would increase from 35,510 to 75,500 acres for mule deer (an increase of about 39,990 acres over alternative A) and from 18,200 to 28,400 acres for elk (10,200 acres more than under alternative A).

Changes to deer and elk would result primarily from the following factors.

- Livestock grazing in the crucial habitat areas within critical watershed areas would be eliminated during the spring and reduced to 50 percent of AUMs on 43,679 acres of mule deer winter range and on 45,300 acres of elk winter range. A total of 7,885 AUMs on mule deer and elk winter range would be reserved for watershed. These AUMs would be available to wildlife. The mule deer numbers would be expected to increase by 2,080 animals and the elk would increase by 135 animals over alternative A, by the year 2000.

- Wildlife developments would be restricted on 40,160 acres of critical watersheds to those needed to better distribute the mule deer and elk. These would reduce the rate of increase for these animals by about 1 percent.

- Woodland products collection and ORV use would be restricted on critical watersheds. This would protect 75,000 acres of mule deer and elk winter range from disturbance and habitat loss from these uses. The mule deer numbers would be expected to increase by 350 animals and the elk would increase by 50 animals.

- ORV use and development disturbance would be excluded from 40,160 acres of mule deer and elk winter habitat. Seasonal restrictions would protect an additional 11,560 acres (10,370 acres for mule deer and 1,190 acres for elk) during a critical time. Mule deer and elk numbers would be expected to increase by 140 mule deer and 15 elk.

The mule deer and elk populations would increase from 6,620 to about 9,200 deer (prior stable) and from 600 to 750 elk. This is an increase of about 2,580 mule deer and 150 elk by the year 2000 compared to alternative A.

Riparian and Aquatic Habitat

The area of riparian and aquatic habitat would increase from 14,780 acres to 15,030 acres, 250 acres more than under alternative A. There would be an undetermined amount of improvement in the vigor and density of riparian vegetation.

The net increase of about 250 acres of riparian and aquatic habitat would result primarily from the following factors:

- Elimination of losses now occurring on riparian and aquatic habitat by exclusion of ORVs and development activities would allow a 100-acre increase in riparian habitat.

- Livestock exclusions from riparian areas and reduced stocking rates for livestock would allow for complete rest through the growing season and allow riparian and aquatic habitat to increase by 150 acres.

Threatened or Endangered Animals

The bald eagle and peregrine falcon would benefit from the improved condition of riparian habitat and from its 250-acre increase to a total of 15,030 acres.

The known peregrine falcon nest would be protected from development activities, recreation use, and mining claim work under this alternative.

The prairie dog towns, which are potential black-footed ferret habitat, would be protected from potential disturbance from ORV use in this alternative.

Conclusion

Crucial habitat for desert bighorn sheep would increase to 175,000 acres, allowing populations to 750 animals.

Habitat for antelope would be 507,000 acres, but improved management would allow antelope populations to grow to 1,000 animals.

Crucial habitat for mule deer and elk would increase to 75,500 acres for mule deer and 28,400 acres for elk, allowing populations to increase to 9,200 mule deer and 750 elk.

Riparian and aquatic habitat would increase 250 acres to 15,030 acres. There would be no adverse impacts to T/E species.

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HUMAN USES

Grazing

Grazing would be allowed on 18,490 fewer acres in this alternative than in alternative A, on 91 allotments. The decrease in acres of livestock forage would result from exclusion of livestock grazing in the Bowknot Bend ACEC (1,830 acres), the North Big Flat Top ACEC (190 acres), and the Hebes Mountain ACEC (960 acres). However, these areas are mostly inaccessible to livestock. Eight isolated allotments would be lost through land disposal, and two allotments would be combined for improved management. Additional areas excluded from livestock grazing would include Dry Lake Archaeological District ACEC (16,990 acres), Temple Mountain Historic District ACEC (2,660 acres), Tomsich Butte Historic District ACEC (2,040 acres), and Swasey Cabin ACEC (220 acres).

Currently, livestock grazing occurs at approximately the 5-year average licensed use level of 56,871 AUMs; operator demand is not equal to the allowable active preference of 88,252 AUMs. It is assumed that operator demand for livestock forage will remain at the 5-year averaged use level, but may increase to allowable active preference. Therefore, a range is used for analysis purposes.

In this alternative, livestock AUMs could decrease 27,479 (49 percent less than alternative A) for 5-year average licensed use. Active preference could decrease by 43,284 AUMs (52 percent less). The licensed use would be within the range of 28,682 to 44,258 AUMs, depending upon operator demand.

This decrease would result primarily from licensing AUMs at 50 percent of active preference and 50 percent of 5 years average licensed use in critical watershed areas (appendixes I and T). It is assumed that this reduced licensing in conjunction with elimination of spring grazing (85 allotments) would aid in protection of critical watershed areas. The only increase in AUMs would result from less ORV disturbance (1,993 fewer AUMs).

Nineteen new AMPs would be implemented, 4 existing AMPs modified and implemented, and 6 existing AMPs continued. These AMPs would be managed to protect critical watershed areas and sensitive soils.

Spring use would be eliminated on 85 allotments to protect critical watershed areas from March 1 through May 31. This would decrease surface disturbance during high runoff periods. Cool season grasses would increase in density and vigor. An increase in vegetation cover would decrease erosion as well. Spring grazing without periodic rest would continue on four allotments.

Conclusion

The area avalable for livestock grazing would decrease 18,490 acres to 1,592,630 acres.

Livestock forage use may decrease from 56,161 to 28,682 5-year average licensed use AUMs and from 87,542 to 44,258 active preference AUMs. The licensed use would be within the range of 28,682 to 44,258 AUMs, depending upon operator demand.

Forest Product Use

Under alternative D, of the 451,270 forested acres, 6,800 would be excluded from campfire wood collection; use would decrease by 6,800 acres from alternative A to 444,470 acres because of cultural ACECs and developed recreation site restrictions. Acres available for designation for private and commercial forest product harvest would decrease by 133,840 acres to 301,820 acres because of relict vegetation, cultural and scenic ACECs, developed recreation sites, ROS class areas, critical watershed, and riparian and aquatic habitat restrictions. While this change in acreage would affect the available supply, adequate area would remain available to meet the demand for dead wood and forest product harvest.

Conclusion

As in alternative A, based on past use and present harvest, an adequate supply of dead wood and live forest products would be available in 301,820 acres through the year 2000.

Cultural Resources

Under alternative D, 1,507 of the planning area's 70,000 cultural resources would be damaged or destroyed (a decrease of 5,228 from alternative A). This reduction in the number of sites damaged or destroyed would result from fewer areas being open to ORV use and less project development, fewer grazing animals, and land disposal.

Cultural resources inventoried and available for use would decrease to 2,385, a decrease of 104. Because of reduced development activities, fewer required inventories would be conducted; consequently, fewer sites would be identified.

Conclusion

Under alternative D, about 1,507 cultural resources would be damaged or destroyed (a decrease of 5,228 from alternative A). About 2,385 cultural resources would be available for use (104 fewer than under alternative A.

Recreation

Alternative D would increase primitive and semiprimitive recreation opportunities while decreasing ORV user access and opportunities for cross-country travel. The P class would increase 44,560 acres from alternative A to a total of 114,240 acres; the SPNM class would increase 49,540 acres to a total of 232,950 acres; the SPM class would increase 53,380 acres to a total of 716,250 acres; the RN class would decrease 135,280 acres to a total of 471,440 acres; and the R class would decrease 5,410 acres to a total of 5,260 acres. The U class would increase by 10 acres to a total of 30 acres.

The increased demand for nonmotorized activities would probably be accommodated in existing settings; however, management actions to encourage dispersed use could be required in a few areas. Commercial visitation would increase under alternative D because natural and scenic values associated with commercial recreation ventures would be preserved.

A large increase in wildlife numbers under alternative D would result in a beneficial secondary impact to recreation by increasing wildlife viewing and hunting opportunities.

Cross-country recreational ORV use would be constrained under alternative D; however, scenic values important to ORV recreationists would be protected. Only 172,360 acres (1,366,830 less than alternative A) would be open to ORV use, decreasing access and opportunities for cross-country travel. ORV use would be limited by seasonal restrictions on 84,770 acres to protect mule deer, elk, desert bighorn sheep, and antelope. ORV use would be limited to designated roads and trails on 840 acres (all increase from alternative A); the remaining 1,281,220 acres (all increase from alternative A) of the planning area would be closed to ORV use to protect SPNM class areas, ACECs, critical watershed areas, and riparian and aquatic habitat. Closure of these areas would help to retain the nonmotorized settings and focus management attention on recreation, and maintaining natural, scenic, and cultural values.

Adjustments in the season of use for livestock (eliminating spring use) and overall reduction of livestock numbers would increase the quality of the recreation experience.

Management objectives would help to retain unusual recreation opportunities and scenic values identified in the wild and scenic rivers eligibility and potential classification study (appendix J) for the majority of the San Rafael River, the lower portion of Labyrinth Canyon (Green River), and Muddy Creek.

Conclusion

In relation to alternative A, the ROS class acreages would shift toward the resource-dependent (primitive) end of the spectrum, increasing the acreage available for activities in undeveloped settings and decreasing ORV access and opportunities for cross-country exploration. The P class would increase to 114,240 acres; the SPNM class would increase to 232,950 acres; the SPM class would increase to 716,250 acres; the RN class would decrease to 471,440 acres; and the R class would decrease to 5,260 acres. The U class area would increase to 30 acres.

Areas open to ORV use would decrease to 172,360 acres, reducing access and opportunities for cross-country travel. Areas limited by seasonal restrictions would increase to 84,770 acres; areas limited to designated roads and trails would increase to 840 acres; and closed areas would increase to 1,281,220 acres.

Visual Resources

Alternative D would place 430,450 acres in VRM class I (all increase from alternative A). The class I area would include SPNM ROS class (232,950 acres); I-70 Scenic Corridor, Gilson Buttes, Muddy Creek, San Rafael Canyon, San Rafael Reef, Segers Hole, and Sids Mountain ACECs. Class I objectives would be required to be met within the scenic ACECs; this could cause some projects to be denied.

Other VRM class areas would decrease as acreage shifts into class I. Class II would decrease 325,150 acres to 168,220 acres; class III would decrease 37,730 acres to 345,540 acres; and class IV would decrease 64,570 acres to 594,980 acres.

It is projected that by the year 2000, in 67 cases, visual contrast rating scores would exceed the VRM class objectives for that area (a decrease of 53 for alternative A projections).

Conclusion

The area in VRM class I would increase to 430,450 acres. The area in other VRM classes would decrease a corresponding amount: to 168,220 acres in class II; to 345,540 acres in class III; and to 594,980 acres in class IV. In 67 cases, visual contrast rating scores would exceed the VRM class objectives.

Lands

Under alternative D, no right-of-way corridors would be designated (no change). Lands available (standard conditions) for rights-of-way would decrease by 1,313,270 acres to a total of 172,330 acres (168,510 acres in SRRA (a decrease of 1,244,440 acres) and 3,820 acres in FPU (a decrease of 68,830 acres)). Avoided areas would increase by 32,000 acres to a total of 85,590 acres (77,990 acres in SRRA (an increase of 27,100 acres) and 7,600 acres in FPU (an increase of 4,900 acres)). Excluded areas would increase to a total of 1,281,270 (1,217,340 in SRRA and 63,930 in FPU (all increase)).

Lands available for disposal under alternative D would decrease by 5,400 acres to total 1,420 acres (710 acres in SRRA (a decrease of 5,070 acres) and 710 acres in FPU (a decrease of 330 acres), a result of eliminating parcels considered to have riparian and watershed values.

The amount of land withdrawn from entry would increase by 1,280,290 acres to total 1,282,070 acres (1,218,140 acres in SRRA (an increase of 1,216,360 acres) and 63,930 acres in FPU (all increase)). Lands would be withdrawn from entry within the Swasey Cabin, Pictographs, Dry Lake, Temple Mountain, Tomsich Butte, Gilson Butte, I-70 Scenic Corridor, Muddy Creek, San Rafael Canyon, San Rafael Reef, Segers Hole, and Sids Mountain ACECs, as well as critical watersheds, riparian and aquatic habitat areas, developed recreation sites, and SPNM ROS class areas.

Lands identified for possible acquisition under alternative D total 2,400 acres of state lands (all increase and all in SRRA) within Dry Lake (1,320 acres), Little Black Mountain (560 acres), and Tomsich Butte (520 acres) ACECs. Actual acreages may be adjusted for ease of management.

Conclusion

No right-of-way corridors would be designated (no change). Lands available (standard conditions) for rights-of-way would decrease to 172,330 acres. Avoided areas would increase to 85,590 acres. Excluded areas would increase to 1,281,270 acres.

Lands available for disposal under alternative D would decrease to 1,420 acres. Lands withdrawn from entry would increase to 1,282,070 acres. Lands identified for possible acquisition under alternative D total 2,400 acres of state lands (all increase and all in SRRA).

ECONOMIC CONSIDERATIONS

Minerals

The area covered by special conditions would increase 24,190 acres (39 percent) relative to alternative A, which would increase the cost and lower the output value of mineral exploration and development in these areas.

With effective coordination of manpower and equipment, the proposed seasonal special conditions would not add to activity cost. However, the seasonal conditions could be costly (more than a 1 percent cost increase) if they idle equipment and labor. Seasonal conditions could also force demobilizing and remobilizing equipment when an exploratory well is followed up with development wells, adding more than 5 percent to development cost. This has rarely been a problem with existing seasonal stipulations.

Under this alternative there would be a large increase in acreage where mineral exploration and development would be excluded in areas closed to resource use or production and essentially be excluded beyond a 1-mile buffer around no-surface occupancy zones.

Mineral materials hauling distances would exceed 20 miles, doubling the cost of getting these materials to the point of use. Major roads would still be maintained with the greater expense; maintenance of lesser roads may not continue.

The large decrease in area available for new mineral activity would be far more significant than any increased local expenditures due to the special conditions. Based on the assumed decrease in oil and gas activity, mineral material and locatable mineral exploration and development, mineral-related employment, earnings, and taxing district revenues should decrease as shown here.

		Total	Change from Alternative A
Emery County	Employment (jobs)	83	-277
	Earnings ($)	2,314,600	-7,778,600
	Revenue ($)	36,700	-110,200
Carbon-Emery County	Employment (jobs)	131	-437
	Earnings ($)	2,861,600	-9,608,100
	Revenue ($)	134,900	-436,500

Soil and Water

Sediment yield resulting from the surface disturbance projected under this alternative would decrease annual damage to downstream capital investments by $47,800 to $388,600 over alternative A. Salt loading resulting from the surface disturbance projected under this alternative would decrease annual damage to water users in the lower Colorado River basin by $798,400 to $1,196,500 over alternative A.

Livestock Grazing

All 139 operators would have less available forage. Changes in available forage would change rancher income by affecting herd size, weight gains, calf survival rates, or operating costs. Of the 139 livestock operators, 129 would be excluded from using public rangeland forage at some point in the spring. The spring livestock exclusions would be of particular concern as most operators have few options with which to respond to these exclusions. Replacing forage lost through spring exclusions with hay would represent a worst-case analysis.

The number of operators affected, the degree of impact, and the related effects on local employment and earnings are presented in tables 65 and 66. The combined effect of spring exclusions and changes in available forage would reduce operator returns above variable cost by $798,400, an 88 percent decrease.

Based on the direct effects from the budget analysis and on the indirect and induced effects derived from a county economic model, it is estimated that local employment, earnings, and taxing district revenues would decrease as shown here.

		Total	Change from Alternative A
Emery County	Employment (jobs)	57	-99
	Earnings ($)	166,700	-292,700
	Revenue ($)	115,900	-203,502
Carbon-Emery County	Employment (jobs)	88	-154
	Earnings ($)	400,600	-703,300
	Revenue ($)	263,600	-462,800

TABLE 65

Number and Degree of Livestock Operator Impacts, Alternative D

	Operators with an Increase from Existing Use and Net Revenues			Operators Not Affected	Operators with a Decrease from Existing Use and Net Revenues		
	Over 51%	11 to 50%	1 to 10%		1 to 10%	11 to 50%	Over 51%
Public rangeland forage	0	0	0	0	0	19	120
Total feed requirements	0	0	0	0	36	101	2
Operator returns above variable costs	0	0	0	0	6	46	87

TABLE 66

Aggregate Economic Impacts to Livestock Operators, Alternative D

Livestock Operators	Baseline Situation	Alternative D
Gross Revenue	$2,920,700	$1,177,500
Total Variable Cost	2,008,400	1,063,600
Returns Above Variable Cost	912,200	113,900
Returns to Labor and Investment[a]	158,000	-732,600
Livestock Numbers (cattle)	9,206	3,422
(sheep)	3,761	1,185
Total Earnings, Emery County	$459,500	$166,700
Total Employment, Emery County (jobs)	156	57
Total Earnings, Carbon-Emery County	1,103,900	400,600
Total Employment, Carbon-Emery County	242	88

NOTE: These budgets assume that ranchers have no long-term outstanding debt, that all operating capital is borrowed, and that existing ranchers would not go out of business.

[a] Returns net of variable and fixed costs to management, non-hired labor, machinery, equipment, and land.

Any grazing permit change could affect ranch value and therefore operator wealth, particularly if the changes affect the ranch's total carrying capacity. The decrease in available forage would decrease aggregate operator wealth by $1,196,500, a 5.2 percent decrease.

Base properties are used as collateral for some types of loans. Since aggregate base property values are projected to decrease under this alternative, the level of total indebtedness allowed should also decrease. The operators' abilities to obtain and repay loans would change in proportion to their projected incomes.

The limitations on range improvements may increase the cost of maintaining and replacing range improvements. These limitations cannot render existing improvements uneconomic to maintain or replace; however these limitations may prevent new improvements from being installed by either outright exclusions or by rendering the projects uneconomic through special conditions.

Recreation

Recreation use of the planning area and its related local importance is projected to increase as described in alternative A. The relative mix of uses may change because of changes in recreational opportunities from alternative A (see impacts to recreation). The large area closed to recreational cross-country ORV travel could reduce total ORV use of the area. The local economic effect of this decrease in ORV use and changing mix of opportunity settings is unknown. However, judging from the existing economic importance of recreation in the planning area (less than 0.1 percent of local employment and earnings), these changes would have little effect on the local economic conditions.

Existing commercial outfitters rely heavily on the P, SPNM, and SPM opportunity settings available in the planning area. The 37 percent gain of P and SPNM, and 8 percent gain in SPM opportunity settings from alternative A could increase the demand for outfitter services. Because projected demand for commercial services is small and would comprise a small portion of any outfitters' business, these changes in opportunity settings would have little economic effect.

There is no known relationship between special management designations and recreation use. Publicity following designation could increase public awareness of these lesser known areas, and therefore increase visitation and related local expenditures. Even if visitation to these special designation areas were doubled, the local economic effect would be insignificant. This effect, however, could be significant to outfitters who might use these areas.

Desert bighorn sheep, antelope, deer, and elk populations are projected to increase from alternative A. Assuming that population/harvest, harvest/hunter, and population/primary nonconsumptive use ratios remain constant, projected wildlife use and related expenditures would increase employment, earnings, and taxing district revenues as shown here.

		Total	Change from Alternative A
Emery County	Employment (jobs)	30	+10
	Earnings ($)	261,300	+87,000
	Revenue ($)	40,100	+13,400
Carbon-Emery County	Employment (jobs)	79	+26
	Earnings ($)	1,057,400	+352,000
	Revenue ($)	63,500	+21,100

Other Land Uses

Special conditions, the no-surface-occupancy stipulation, and closures to resource use and production would affect other land uses in much the same way as they affect mineral activities. Some activities within areas of restricted ORV use would require additional coordination with BLM through a lands action which would not otherwise be required. Much of the increased costs associated with activities in special-condition and no-surface-occupancy zones would be spent in the local economy, thereby increasing local employment and earnings. However, the large decrease in area effectively open to other land uses would be far more significant than any increase in local expenditures due to the added stipulations. The resulting local employment, earnings, and taxing revenue loss cannot be projected.

Based on the assumed decrease, lands actions and other land-use-related employment, earnings, and taxing district revenues should decrease as follows.

		Total	Change from Alternative A
Emery County	Employment (jobs)	9	-27
	Earnings ($)	118,700	-376,000
	Revenue ($)	10,800	-34,300
Carbon-Emery County	Employment (jobs)	12	-36
	Earnings ($)	154,700	-490,000
	Revenue ($)	18,300	-57,900

The proposed land disposals would be widely scattered through Castle Valley and would represent a 2.7 percent decrease from the private land base relative to alternative A. This decrease in private land base would not affect nearby land values, but would decrease local taxing revenues by at least $5,400 from alternative A.

The large area avoided and excluded from major utility lines could force the relocation of new facilities, thereby increasing their cost.

Plan Budget

The 14 percent increased budget over alternative A needed to implement this alternative would bring the following economic changes.

		Total	Change from Alternative A
Emery County	Employment (jobs)	10	+1
	Earnings ($)	120,300	+14,600
	Revenue ($)	2,700	+300
Carbon-Emery County	Employment (jobs)	41	+5
	Earnings ($)	774,600	+93,800
	Revenue ($)	21,600	+2,600

Conclusion

Mineral-related local employment, earnings, and taxing district revenues are projected to decrease. Sediment- and salinity-related costs would decrease. Livestock operator returns above variable costs, ranch value, and associated local employment, earnings, and taxing district revenues would decrease. The aggregate increase of P, SPNM, and SPM acreage could increase the demand for commercial outfitter services in the area, although this effect would be insignificant. Wildlife-related local employment, earnings, and taxing district revenues would increase. Increased management restrictions would decrease other land use activity and local related employment, earnings, and taxing district revenues. The fewer land disposals would decrease taxing district revenues in Emery County. The large area avoided and excluded from major utility lines could increase their construction cost. The increased budget needed to implement this alternative would increase local employment, earnings, and taxing district revenues.

SOCIAL CONDITIONS

Activity exclusions and restrictions could affect existing social conditions. The mineral and livestock industries would be most affected; however, the economic impacts would be spread over most industries except manufacturing and industries related to recreation. The loss of employment opportunity would cause both a reduction of living standards and possibly some outmigration from the area. Livestock operators would be most affected. Some operators would be forced to seek a second job, and operators who are forced to sell their operations would have to change their way of life entirely. Some ranchers do not have the training and skills to enter new job markets.

Conclusion

Social conditions of some nearby communities could be affected and the lifestyles of many ranchers would change.

ALTERNATIVE E

MINERAL COMPONENTS

Oil and Gas

Under alternative E, the area open to lease would increase by 119,200 acres from alternative A. However, this increase would not affect production, since most of the opened areas have low and moderate potential for oil and gas (appendix Q).

Leasing category acreages under alternative E compare as follows to those under alternative A.

Category	Unit	Acres	Change from Alternative A
1	SRRA	442,730	-687,550
	FPU	29,080	-22,690
	Subtotal	471,810	-710,240
2	SRRA	864,990	+821,860
	FPU	43,570	+25,300
	Subtotal	908,560	+847,160
3	SRRA	154,210	-15,110
	FPU	2,700	-2,610
	Subtotal	156,910	-17,720
4	SRRA	1,910	-119,200
	FPU	0	0
	Subtotal	1,910	-119,200

The category 1 and category 2 acreage changes would result from the addition of seasonal restrictions to protect habitat for wildlife such as antelope and bighorn sheep and restrictions to protect R&PP leases and SPM ROS class areas. These restrictions would increase operating and production expenses, but are not expected to affect production. The area in category 2 includes high, moderate, and low potential for oil and gas.

Areas with no-surface-occupancy restrictions (category 3) include ACECs.

The closures to leasing (category 4) would be attributable primarily to developed recreation sites and motorcycle trails. The closed areas are in areas of low potential for oil and gas, while the category 3 areas have mostly low to moderate potential for oil and gas.

Protective conditions would be imposed on geophysical operations in the ACECs, but these conditions would not affect the 100 miles of seismic line completed, which would be the same as for alternative A.

Production of oil and gas would be the same as in alternative A, with production reaching 13,200 barrels of petroleum and 754,000 MCF of natural gas per year at year 2000.

Conclusion

The area open to oil and gas leasing would increase by 119,200 acres to 471,810 acres in category 1, increase to 908,560 acres in category 2, decrease to 156,910 acres in category 3, and decrease to 1,910 acres in category 4. The number of miles of seismic line run per year would be the same as in alternative A (100 miles). The annual production rates for oil and gas would be the same as in alternative A, with production reaching 13,200 barrels of petroleum and 754,000 MCF of natural gas per year at year 2000.

Coal

Under alternative E, the area available for coal exploration would be 62,290 acres, the same as in alternative A. The 13,680 acres of KRCRAs (5,360 in SRRA and 8,320 in FPU) would have special conditions to protect recreation values which are the same as existing regulations governing coal exploration, leasing, and production. Therefore, the impacts to coal resources would not change from those described under alternative A. Coal production would remain at 150,000 tons per year.

Conclusion

Under alternative E, impacts to coal resources would not change from alternative A: 62,290 acres would be available for exploration; 58,190 acres would be available for lease; and production would remain at 150,000 tons per year.

Mineral Materials

Under alternative E, areas open to disposal of mineral materials would decrease by 158,820 acres to a total of 1,380,370 acres (1,307,720 acres in SRRA (a decrease of 156,120 acres) and 72,650 acres FPU (a decrease of 2,700 acres)). The reduction in area open to disposal of mineral materials can be attributed to ACECs. This decrease would not affect production, because the closed areas have little demand for mineral materials, and the small demand can be supplied from adjacent open areas. Production of mineral materials would be the same as alternative A at 320,000 cubic yards per year at year 2000.

Conclusion

Under alternative E, the area open to material disposal would decrease by 158,820 acres to 1,380,370 acres. The annual mineral material production rate would be 320,000 cubic yards at year 2000 (no change from alternative A).

Locatable Minerals

Under alternative E, the area open to mineral entry would decrease by 1,910 acres to total 1,535,500 acres (1,460,150 in SRRA (a decrease of 1,910 acres) and 75,350 acres in FPU (no change)). In areas with high potential for uranium, 30 acres (all in SRRA) would be withdrawn from entry. The remainder of the withdrawn area falls into areas of moderate, low, and no potential. In areas with high and moderate potential for gypsum, 720 acres (all in SRRA) would be withdrawn from entry. The remainder of the area withdrawn would be in areas of low to no potential for gypsum (appendix Q). Areas withdrawn from entry include motorcycle trails and developed recreation sites.

In alternative E, standard conditions would be applied to 1,305,940 acres in SRRA and 72,650 acres in FPU, for a total of 1,378,590 acres in the planning area. Special conditions would be applied to scenic, vegetation, and cultural ACECs covering 154,210 acres in SRRA and 2,700 acres in FPU, for a total of 156,910 acres in the planning area. Compliance with the special conditions would be required to the extent possible without curtailing operators' rights. Filing plans of operation and complying with special conditions would increase operators' costs, which could result in an unquantified decrease in exploration and development work. If 7,810 acres identified for land disposal are sold, the area open to mineral entry would be reduced.

Conclusion

Under alternative E, the area open to mineral entry would decrease to 1,535,500 acres.

BIOTIC COMPONENTS

Soils

Under alternative E, there should be a decrease in soil loss over Alternative A. This is because of decreases in soil loss from ORV use designations, changes in livestock management, minerals activities and land disposal.

ORV use designations as discussed under alternatives A and C may cause an estimated decrease in soil loss of between 68,550 and 518,750 tons per year. The motorcycle trail would be closed to grazing under this alternative. However, this ORV use may show a greater increase in the soil loss than grazing would cause, but the potential change cannot be quantified.

A decrease in soil loss under this alternative may be due to changes in livestock grazing management. These changes are either closing areas to livestock grazing or changing the season of use. Soil loss due to livestock changes could decrease by between 1,133,750 and 9,435,000 tons per year.

A decrease in soil loss of between 190 and 1,400 tons per year is expected due to the decrease in mining claims and assessment work.

Estimates of soil loss are based on the amount of public land in the planning area. Disposal of public lands results in less BLM acreage available to contribute to total soil loss. Land disposal could account for a decrease in soil loss of between 11,800 and 34,780 tons per year over alternative A.

A 2,000-acre vegetation manipulation would be done in FPU under this alternative. The value of such land treatments in reducing erosion and sediment yield is not clear. Long-term effects appear to be beneficial, not only for increasing ground cover (which stabilizes soils), but also for improving rilling and gullying on the soil types that would be treated in the resource area. Short-term losses occur from nearly any treatment technique but this would be balanced out by the improvement in cover over the long term [Hansen, 1986].

The soil losses contributed by other factors would continue to be as described under alternative A. Therefore, total soil loss could be between 6,053,250 and 51,394,370 tons per year (averaging 28,723,810 tons per year) by the year 2000, a decrease of between 1,210,490 and 9,989,930 tons per year (average decrease of 5,600,210 tons per year).

Conclusion

Total soil loss could be between 6,053,250 and 51,394,370 tons per year (averaging 28,723,810 tons per year).

Water

Surface water quality should improve under alternative E compared to alternative A. The improvement would correspond to the lower rate of soil loss that should occur under alternative E (see Soils). This is because of decreases in sediment and salt yield from ORV use designations, changes in livestock management, minerals activities and land disposal.

ORV use designation may cause an estimated decrease of between 27,420 and 207,500 tons per year of sediment and a decrease of between 452 and 3,488 tons per year of salt (see alternatives A and C). The motorcycle trail would be closed to grazing under this alternative. The surface-disturbing activities associated with this activity may add more salt and sediment to the system than grazing would, but the potential change cannot be quantified.

A decrease in sediment and salt yield under this alternative could be due to changes in livestock grazing management. These changes are either closing some areas to livestock grazing or changing the season of use. Sediment yield due to changes in livestock grazing may decrease by between 453,500 and 3,774,000 tons per year. Salt yield may decrease by between 4,600 and 66,400 tons per year.

Less activity would take place on mining claims and assessments which could result in a decrease in sediment yield of between 70 and 560 tons per year and a decrease in salt yield of between 1 and 5 tons per year.

Estimates of sediment and salt yield are based on the amount of public land in the planning area. When land is disposed of, less BLM acreage is available to contribute to sediment and salt yield. Land disposal could account for a decrease in sediment of between 3,200 and 13,910 tons per year over alternative A. Salt yield could decrease by 65 and 239 tons per year.

A 2,000-acre vegetation manipulation would be done in FPU (see Soils) but this would have a negligible effect on the water resources.

Other impacts to surface and ground waters would be as described under alternative A. Total sediment yield to the Colorado River could be between 2,421,310 and 20,557,740 tons per year (averaging 11,489,525 tons per year) by the year 2000, a decrease of between 484,190 and 3,995,970 tons per year (average decrease of 2,240,080 tons per year).

Total salt yield could be between 24,352 and 360,785 tons per year (averaging 192,569 tons per year) by the year 2000, a decrease of between 5,118 and 70,132 tons per year (average decrease of 37,625 tons per year).

Conclusion

Surface water quality should improve under alternative E over alternative A. Total sediment yield could be between 2,421,310 and 20,557,740 tons per year (averaging 11,489,525 tons per year), a decrease of between 484,190 and 3,995,970 tons per year (average decrease of 2,240,080 tons per year) from alternative A. Total salt yield could be between 24,352 and 360,785 tons per year (averaging 192,569 tons per year), a decrease of between 5,118 and 70,132 tons per year (average decrease of 37,625 tons per year) from alternative A. Ground water quality would probably stay the same. The level of TDS in milligrams per liter cannot be quantified.

Vegetation

Under this alternative, approximately 48,164 acres of vegetation could be disturbed by the year 2000 (short-term disturbance on 40,104 acres and long-term disturbance on 8,060 acres). This would be 6,380 fewer acres than in alternative A. The short-term decrease would primarily be due to less disturbance from ORVs (6,380 fewer acres). Vegetation should be recovered through natural succession or reclamation (with a site-specific seed mix) within 5 years. Long-term vegetation loss would be 990 acres more than under alternative A because of land disposals. Vegetation impact analysis assumptions are presented in appendix 5. Acres of anticipated surface disturbance were listed by activity in table 54. Anticipated changes in ecological condition under alternative E are shown in table 67.

Changes to higher seral stages would result from implementation of existing AMPs and elimination of continual spring grazing. These actions would allow vegetation to recover from grazing through periodic rest, producing a higher density of livestock forage and changes in plant composition. Thus, more acres would change to a higher seral stage.

TABLE 67

Anticipated Changes in Ecological Condition, Alternative E

Ecological Condition Class	Ecological Condition by Percent of Resource Area: Present (1985)	Ecological Condition by Percent of Resource Area: Future (2000)
Potential Natural Community	9	10
Late Seral	22	22
Mid Seral	47	46
Early Seral	9	9
Rock Outcrop/Badlands	13	13

The Bowknot Bend (1,830 acres), North Big Flat Top (190 acres), and San Rafael Reef (43,870 acres) relict vegetation areas would be designated as ACECs under this alternative, whereas no such designations were made under alternative A. The Hebes Mountain relict vegetation area would not receive special protection under alternative E.

Threatened or Endangered Plants

There would be no impact to T/E species from controlled activities. The uncontrolled activities that have the potential to damage habitat for T/E plants are ORV use and mining activities that disturb fewer than 5 acres. However, BLM would monitor the habitat and apply mitigating measures to prevent impacts to T/E plant species. There would be no impacts to T/E plant species habitat under alternative E.

Conclusion

Short-term vegetation loss would decrease 7,370 acres to 40,104 acres. Long-term vegetation loss would increase 990 acres to 8,060 acres. Changes to higher seral stages would result. Three relict vegetation areas would receive special protection. There would be no adverse impact to T/E species.

Wild Horses and Burros

Under alternative E, the area available for wild horses and burros would be 475,680 acres, the same as alternative A. It is expected that enough AUMs would be available within the total wild horse and burro area to accommodate from 250 to 325 head of wild horses and from 110 to 140 head of wild burros. These animals would add to the recreational experience of ORV users.

Forage requirements would be 3,935 AUMs.

Conflicts in use between wild equids and livestock would be resolved and adjustments in specific forage use would be made at the activity plan level in conjunction with grazing decisions or at any time deemed necessary as a result of rangeland monitoring.

Conclusion

The wild horse and burro range would be 475,680 acres. Wild horse numbers would range betgween 250 and 325 head. Wild burro numbers would range between 110 and 140 head. The forage requirement for these animals at the highest number would be 3,935 AUMs. Wild equids would be removed when they reached the higher numbers to approximately the lower numbers. Forage use levels may be adjusted for equids and livestock based on monitoring data.

Wildlife

Desert Bighorn Sheep

Crucial habitat would decrease from 150,000 to 140,000 acres for desert bighorn sheep. This is about 10,000 fewer acres than alternative A. Desert bighorn sheep habitat changes would result primarily from the following factors:

- Livestock use would not be changed more than 2 percent; competition with desert bighorn sheep would continue, as would the potential for disease transmission;

- ORVs would be restricted to existing roads and trails over the entire desert bighorn sheep habitat during the critical periods. However, ORV use would not be limited during the rest of the year and would cause some loss of forage and stress, especially if the use occurs in crucial habitat at the level possible under this alternative. The desert bighorn sheep would not increase to their full potential, but would increase by about 5 sheep.

The population of desert bighorn sheep would increase from 500 to about 550 animals, about 50 more than alternative A by the year 2000.

Antelope

Antelope habitat would decrease to 506,680 acres, 320 acres less than under alternative A. Changes to the antelope numbers would result primarily from the following factors:

- ORV use would be limited to designated roads and trails and development activities in crucial habitat areas would be restricted during the critical period; however, ORV use during other times would reduce the forage available to antelope on appproximately 360,000 acres and reduce their potential increase to 50 animals. Development activities would remove 360 habitat acres.

- Elimination of spring and fall livestock grazing in crucial antelope habitat areas would reduce competition between antelope and livestock for spring grasses and forbs, allowing antelope population to increase by about 200 animals.

The population of antelope would increase from 700 to about 950 animals, a net increase of 250 animals over alternative A.

Mule Deer and Elk

Crucial habitat would decrease to 35,000 acres for mule deer and decrease to 17,700 acres for elk (510 fewer acres for deer and 500 fewer for elk than under alternative A), a net loss of about 170 mule deer and 10 elk from alternative A. The following factors explain the changes to animal populations:

- Lack of seasonal restrictions on mule deer and elk winter habitat would allow as much as 500 acres of disturbance during a critical period. Assuming that each deer needs 10 acres of crucial winter range and that each elk needs 40 acres, the surface disturbance allowed under this alternative would result in a loss of 50 mule deer and 12 elk.
- The change in season of livestock use from spring and fall to winter would increase livestock competition with mule deer and elk for the limited winter forage, causing mule deer and elk populations to decrease by 80 and 7, respectively.
- Unrestricted ORV use over the entire mule deer and elk winter habitat would stress the animals and cause a direct loss of forage. Mule deer could decrease by 40, and elk could decrease by 3.

The population of mule deer and elk would decrease to about 6,450 mule deer (170 fewer than under alternative A) and 590 elk (10 fewer than under alternative A).

Riparian and Aquatic Habitat

The area of riparian and aquatic habitat would remain the same as in alternative A, at 14,780 acres. Condition would not change, because improved conditions from restricted livestock grazing would be offset by the lack of restrictions on ORV use.

Threatened or Endangered Animals

Riparian management would be required to ensure sufficient reproduction of cottonwood trees for bald eagle roosts. Any loss in the riparian habitat would affect potential habitat for T/E animals. The restriction on development activities in riparian and aquatic habitat areas would limit potential impacts, and BLM would monitor the habitat and apply mitigation measures to prevent other potential impacts from mining claim work (on fewer than 5 acres) and from ORV use. Monitoring and mitigation would also protect the prairie dog towns, which are potential black-footed ferret habitat. There would be no impact to T/E animals under this alternative.

Conclusion

Crucial habitat for desert bighorn sheep would decrease to 140,000 acres; however, populations are expected to increase to 550 by the year 2000.

Antelope habitat would decrease to 506,680 acres; however, antelope population is expected to increase to 950 by the year 2000.

Crucial habitat for mule deer would decrease to 35,000 acres, and crucial habitat for elk would decrease to 17,700 acres. The deer population would increase to 6,450 animals, and the elk population would increase to 590.

Riparian and aquatic habitat would remain at 14,780 acres (no change from alternative A). There would be no adverse impact to T/E animal species under alternative E.

HUMAN USES

Grazing

Grazing would be allowed on 3,070 fewer acres than in alternative A, on 91 allotments. Eight isolated allotments have been identified for disposal, and two allotments would be combined for improved management. Under this alternative the Bowknot Bend ACEC (1,830 acres) and the North Big Flat Top ACEC (190 acres) would be excluded to livestock grazing. However, these areas are inaccessible to livestock and exclusion from grazing in these areas would not reduce grazing areas. Additional areas excluded from grazing would include developed recreation sites (60 acres) and the Temple Mountain Motorcycle Trail (1,900 acres).

Currently, livestock grazing occurs at approximately the 5-year average licensed use level of 56,871 AUMs; operator demand is not equal to the allowable active preference of 88,252 AUMs. It is assumed that operator demand for livestock forage will remain at the

5-year averaged use level, but may increase to allowable active use. Therefore, a range is used for analysis purposes.

In this alternative, 5-year averaged licensed use could decrease 1,059 AUMs (2 percent) and active preference could decrease 1,014 AUMs (1 percent). The licensed use would be within the range of 55,102 to 86,528 AUMs, depending upon operator demand. This decrease would be primarily due to an increase in land disposals (176 AUMs more). An additional 79 AUMs would be lost due to cattle being excluded from the Temple Mountain motorcycle trail. The only increase in AUMs would be due to less ORV disturbance (370 AUMs less).

Spring grazing would be eliminated on 78 allotments (with SPM ROS classes) from March 15 to June 15 to provide maximum recreational opportunities for ORV users in the spring. On these allotments, the grazing season would be changed to winter (after November 1). A few additional allotments (with SPM ROS classes) had grazing seasons changed from September 1 to November 1 to allow for fall recreation opportunities for ORV users. Only 8 allotments would continue to be grazed during the spring season without periodic rest.

An additional 33 new AMPs would be implemented, with 11 existing AMPs modified and implemented, and 6 existing AMPs would continue. These AMPs would include periodic winter and spring rest to favor improved vigor and density of key livestock forage species. Range improvements would be constructed to aid in livestock distribution. The elimination of spring use on 78 allotments would allow for increased vigor and density of forage.

Conclusion

The area available for grazing would decrease 3,070 acres to 1,609,050 acres.

Livestock forage use may decrease to 55,102 5-year averaged licensed use AUMs and to 86,528 active preference AUMs.

Forest Product Use

Under alternative E, all of the 451,270 forested acres except 510 acres would be available for collection of wood for campfire use because of restrictions on relict vegetation and cultural ACECs, developed recreation sites, and ROS class areas. About 417,870 acres would be available for designation for private and commercial forest product harvest, 17,790 fewer than under alternative A.

A 2,000-acre vegetation manipulation, which would remove pinyon and juniper trees and replace them with grasses, forbs, and shrubs, would allow these areas to be better utilized for woodland harvest but would not increase the available acreage because the areas were already open for harvest. The area used for harvest would still be less than 1 percent of the forested area.

While the decrease in acreage would affect the available supply, adequate area would remain available to meet the demand for dead wood and forest product harvest.

Conclusion

Based on past use and present harvest, an adequate supply of dead wood and live forest products would be available on 417,870 acres, a decrease of 17,790 acres from alternative A through the year 2000.

Cultural Resources

About 6,738 of the 70,000 cultural resources would be damaged or destroyed under alternative E (3 more than under alternative A). This increase in the number of sites damaged or destroyed would result from the unmitigated impact of additional land disposals. A total of 2,489 (including 1,500 sites currently inventoried) cultural resources would remain available for use (no change from alternative A).

Conclusion

The number of cultural resources damaged or destroyed would increase to 6,738. The number of cultural resources available for use would increase to 2,489.

Recreation

Motorized recreation would benefit under alternative E. Opportunities for activities in undeveloped settings would decrease, while opportunities for activities in facility-dependent settings would increase. The P class would total 31,380 acres, a decrease of 38,300 acres from alternative A; the SPNM class would total 186,910 acres, a slight gain of 3,500 acres from alternative A; the SPM class would total 675,550 acres, an increase of 12,680 acres from alternative A; the RN class would total 626,110 acres, an increase of 19,390 acres from alternative A; the R class would total 11,410 acres, 740 acres more than alternative A; and the U class would remain at 20 acres.

The reduction of 119,200 acres in leasing category 4 would allow a shift of seismic and oil and gas activity into previously unavailable P and SPNM classes, accounting for most of the change from alternative A.

The increased demand for nonmotorized activities would probably be accommodated in existing settings; however, management actions could be required in a few areas to disperse visitors. Some visitors would be displaced to other locations outside SRRA because of use restrictions and the loss of primitive recreation opportunities. Commercial visitation would decrease under alternative E due to the loss of P class areas and the reduction of scenic values associated with additional seismic and oil and gas activities.

A slight decrease in wildlife numbers under this alternative would result in a negative secondary impact to recreation by decreasing wildlife viewing and hunting opportunities.

Approximately 1,380,870 acres would be open to ORV use (158,320 fewer acres than under alternative A). ORV access and opportunities for cross-country travel would be slightly constrained; however, sufficient area would remain open to meet the demand for ORV use, and scenic values important to ORV recreationists would be protected. ORV use would be limited to existing roads and trails on 156,910 acres (all increase from alternative A) to protect cultural and scenic ACECs; however, much of that acreage is inaccessible because of its terrain. ORV use would be limited to designated roads and trails on 1,410 acres (all increase from alternative A) to protect relict vegetation ACECs, land leases, and developed recreation sites. Designation of scenic ACECs and management of SRMAs would focus management attention on recreation, and maintaining natural, cultural, and scenic values.

The development and expansion of recreation facilities at the San Rafael Campground, Justensen Flats, Tomsich Butte, The Wedge, and Swasey Cabin would help to meet the increased demand for motorized recreation while reducing user conflicts, human waste, and trash. Elimination of spring and fall livestock use and the overall reduction of livestock numbers would increase the quality of the recreation experience.

Unusual recreation opportunities and scenic values identified in the wild and scenic rivers eligibility and potential classification study for the San Rafael River, Labyrinth Canyon (Green River), and Muddy Creek (appendix J) could be reduced with resource development in or adjacent to the canyons.

Conclusion

Opportunities for activities in undeveloped settings would decrease, and opportunities for activities in facility-dependent settings would increase. The P class would total 31,380 acres; the SPNM class would total 186,910 acres; the SPM class would total 675,550 acres; the RN class would total 626,110 acres; the R class would total 11,410 acres; and the U class would total 20 acres.

Approximately 1,380,870 acres would be open to ORV use (158,320 fewer acres than under alternative A). ORV use would be limited to existing roads and trails on 156,910 acres and limited to designated roads and trails on 1,410 acres.

Visual Resources

Alternative E would place 135,730 acres in VRM class I (all increase from alternative A). Class I areas would include the I-70 Scenic Corridor, Muddy Creek, San Rafael Canyon, and Tomsich Butte ACECs.

VRM class II acreage would increase to 959,610 acres (463,240 acres more than under alternative A). The increase includes SPM ROS class areas.

The shift of acreage into classes I and II would cause class III to decrease by 183,680 acres to 199,590 acres and class IV to decrease by 415,290 acres to 244,260 acres.

It is projected that by the year 2000, in 136 cases, visual contrast rating scores would exceed the VRM class objectives for that area (an increase of 16 from alternative A projections).

Conclusion

The area in VRM class I would increase to 135,730 acres. The area in VRM class II would increase to 959,610 acres. The area in class III would decrease to 199,590 acres, and the area in class IV would decrease to 244,260 acres. In 136 cases visual contrast rating scores would exceed the VRM class objectives.

Lands

Under alternative E, 17,060 acres would be designated as right-of-way corridors (12,890 in SRRA and 4,170 in FPU)all increase over alternative A)). Lands available (standard conditions) for rights-of-way outside corridors would total 454,750 acres (429,840 in SRRA (a decrease of 983,110 acres) and 24,910 acres in FPU (a decrease of 47,740 from alternative A)). A total of 1,065,470 acres would be avoided (1,019,200 in SRRA and 46,270 in FPU) (an increase from alternative A of 1,011,880 acres, 968,310 in SRRA and 43,570 in FPU). An area of 1,910 acres (all in SRRA and all increase from alternative A) would be excluded from right-of-way grants.

Lands available for disposal under alternative E would increase by 990 acres to total 7,810 acres (6,770 in SRRA (an increase of 990 acres), and 1,040 in FPU (no change from alternative A)). The addition would result from adding parcels for community expansion and isolated parcels not previously included that are not needed for other surface-resource uses.

Lands withdrawn from entry would increase to 3,690 acres (a 1,910 acre increase over alternative A, all in SRRA). Developed recreation sites would be withdrawn.

No lands were identified for possible acquisition under alternative E (no change from alternative A).

Conclusion

Corridors for right-of-way systems would be designated on 17,060 acres (all increase); lands available (standard conditions) for rights-of-way outside corridors would decrease to 454,750 acres; avoided areas would increase to 1,065,470 acres; and excluded areas would increase to 1,910 acres (all increase). Lands available for disposal would increase to 7,810 acres. Lands withdrawn from entry would increase to 3,690 acres. No lands would be acquired (no change).

ECONOMIC CONSIDERATIONS

Minerals

The area covered by special conditions would increase 847,160 acres (1,280 percent) compared to alternative A, which would increase the cost and lower the output value of mineral exploration and development in these ares.

The special condition in SPM areas requiring revegetation of surface disturbance to blend with surrounding conditions within 2 years would essentially eliminate mineral activity in some vegetation communities and would increase reclamation cost by 20 percent in other areas.

With effective coordination of manpower and equipment, the seasonal special conditions would not add to activity cost. However, the seasonal conditions could be costly (more than a 1 percent cost increase) if they idle equipment and labor. Seasonal conditions could also force demobilizing and remobilizing equipment when an exploratory well is followed up with development wells, adding more than 5 percent to development cost. This has rarely been a problem with existing seasonal stipulations.

Areas where mineral exploration and development would essentially be excluded (areas of no surface occupancy and areas closed to resource use or production) would be less than under alternative A.

Under this alternative there would be a much larger area where because of special conditions, mineral exploration and/or development would be more costly, some of which would be spent in the local economy. The reduced acreage where mineral activities would be excluded should increase mineral activity. The net effect on the local economy cannot be quantified.

The I-70 corridor exclusion would have the greatest effect on developing and stockpiling of mineral materials. Increased two way hauling distances would average 5 miles, adding an average $2.50 per cubic yard, or approximately 25 percent, to the cost of getting mineral materials to the point of use.

Based on the assumed decrease in oil and gas activity, and locatable mineral exploration and development, mineral-related employment, earnings, and taxing district revenues should decrease as shown here.

		Total	Change from Alternative A
Emery County	Employment (jobs)	359	-1
	Earnings ($)	10,074,400	-18,800
	Revenue ($)	145,000	-1,800
Carbon-Emery County	Employment (jobs)	566	-2
	Earnings ($)	12,445,300	-24,400
	Revenue ($)	568,300	-3,100

Soil and Water

Sediment yield resulting from the surface disturbance projected under this alternative would decrease annual damage to downstream capital investments by $40,200 to $327,300 over alternative A. Salt loading resulting from the surface disturbance projected under this alternative would decrease annual damage to water users in the lower Colorado river basin by $348,800 to $4,483,700 over alternative A.

Livestock

Four operators would have more available forage, 35 would have less, and available forage would remain the same for 104 operators. Losses and gains of livestock forage are discussed in the Grazing sections of this chapter. Changes in available forage would change rancher income by affecting herd size, weight gain, calf survival rates, or operating costs.

Of the 139 livestock operators, 117 would be excluded from using public rangeland forage at some point in the spring. The spring livestock exclusions would be of particular concern, as most operators have few options with which to respond to these exclusions. Replacing forage lost through spring exclusions with hay would represent a worst-case analysis.

The number of operators affected, the degree of impact, and the related effects on local employment and earnings are presented in tables 68 and 69.

The combined effect of spring exclusions and changes in available forage would reduce operator returns above variable cost by $274,700, a 30 percent decrease.

Based on the direct effects from the budget analysis and on the indirect and induced effects derived from a county economic model, it is estimated that local employment, earnings, and taxing district revenues would decrease as follows.

		Total	Change from Alternative A
Emery County	Employment (jobs)	154	-2
	Earnings ($)	453,900	-5,600
	Revenue ($)	315,600	-3,900
Carbon-Emery County	Employment (jobs)	239	-3
	Earnings ($)	1,090,500	-13,400
	Revenue ($)	717,600	-8,800

Any grazing permit change could affect ranch value and therefore operator wealth, particularly if the changes affect the ranch's total carrying capacity. The decrease in available forage would decrease aggregate operator wealth by $53,000, a 0.2 percent decrease.

Base properties are used as collateral for some types of loans. Since aggregate base property values are projected to decrease under this alternative, the level of total indebtedness allowed should also decrease. The operators' abilities to obtain and repay loans would change in proportion to their projected incomes.

The limitations on range improvements may increase the cost of maintaining and replacing range improvements. These limitations cannot render existing improvements uneconomic to maintain or re-

TABLE 68

Number and Degree of Livestock Operator Impacts, Alternative E

	Operators with an Increase from Existing Use and Net Revenues			Operators Not Affected	Operators with a Decrease from Existing Use and Net Revenues		
	Over 51%	11 to 50%	1 to 10%		1 to 10%	11 to 50%	Over 51%
Public rangeland forage	0	4	0	104	22	8	1
Total feed requirements	0	3	0	105	20	8	3
Operator returns above variable costs	0	1	0	23	17	78	20

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TABLE 69

Aggregate Economic Impacts to Livestock Operators, Alternative E

Livestock Operators	Baseline Situation	Alternative E
Gross Revenue	$2,920,700	$2,875,000
Total Variable Cost	2,008,400	2,237,400
Returns Above Variable Cost	912,200	637,500
Returns to Labor and Investment[a]	158,000	-106,000
Livestock Numbers (cattle)	9,206	9,070
(sheep)	3,761	3,646
Total Earnings, Emery County	$459,500	$453,900
Total Employment, Emery County (jobs)	156	154
Total Earnings, Carbon-Emery County	1,103,900	1,090,500
Total Employment, Carbon-Emery County	242	239

NOTE: These budgets assume that ranchers have no long-term outstanding debt, that all operating capital is borrowed, and that existing ranchers would not go out of business.

[a] Returns net of variable and fixed costs to management, non-hired labor, machinery, equipment, and land.

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place; however these limitations may prevent new improvements from being installed by either outright exclusions or by rendering the projects uneconomic through special conditions.

Recreation

Recreation use of the planning area and its related local importance is projected to increase as described in alternative A. The relative mix of uses may change because of changes in recreational opportunities from alternative A (see impacts to recreation). The local economic effect of this changing mix of opportunity settings is unknown. However, judging from the existing economic importance of recreation in the planning area (less than 0.1 percent of local employment and earnings), these changes would have little effect on the local economic conditions.

Existing commercial outfitters rely heavily on the P, SPNM, and SPM opportunity settings available in the planning area. The 14 percent loss of P and SPNM, opportunity settings from alternative A could decrease the demand for outfitter services in these areas. The 2 percent gain of SPM opportunity settings could increase the demand for outfitter services in these areas. Because projected demand for commercial services is small and would comprise a small portion of any outfitters' business, these changes in opportunity settings would have little economic effect.

The additional developed recreation sites should have little to no effect on use and related local expenditures. The services offered should not compete with, and therefore not affect, privately-owned recreation developments or commercial outfitters.

There is no known relationship between special management designations and recreation use. Publicity following designation could increase public awareness of these lesser known areas, and therefore increase visitation and related local expenditures. Even if visitation to these special designation areas were doubled, the local economic effect would be insignificant. This effect, however, could be significant to outfitters who might use these areas.

Desert bighorn sheep, antelope, deer, and elk populations are projected to decrease from alternative A. Assuming that population/harvest, harvest/hunter, and population/primary nonconsumptive use ratios remain constant, projected wildlife use and related expenditures would decrease employment, earnings, and taxing district revenues as follows.

		Total	Change from Alternative A
Emery County	Employment (jobs)	19	0
	Earnings ($)	170,500	-3,800
	Revenue ($)	26,200	-600
Carbon-Emery County	Employment (jobs)	51	-1
	Earnings ($)	689,900	-15,500
	Revenue ($)	41,400	-900

Other Land Uses

Special conditions, the no-surface-occupancy stipulation, and closure of some areas to resource use and production zones would affect other land uses in much the same way as they affect mineral activities. Some activities within areas of restricted ORV use would require additional coordination with the BLM through a lands action which would not otherwise be required. Much of the increased cost associated with activities in special-condition and no-surface-occupancy zones would be spent in the local economy, thereby increasing local employment and earnings. However, the increased costs would also decrease the amount of other land use activity, thereby decreasing local employment and earnings. The net effect on the local economy cannot be quantified, although it is expected to be small.

Land disposals would be widely scattered and would increase the private land base by 0.5 percent compared to alternative A. This increase would not affect nearby land values, but would increase local taxing district revenues by at least $1,000 from alternative A.

The cost of environmental review for major utility lines is typically $8,000 to $15,000 per mile. This review would cost only an estimated $1,500 to $2,000 per mile in the 17,060 acres of utility corridors proposed for designation under this alternative [Pacific Gas, 1981]. The right-of-way avoidance and exclusion areas should have little or no effect on utility line location.

Plan Budget

The 17 percent increased budget over alternative A needed to implement this alternative would bring the increases shown here.

		Total	Change from Alternative A
Emery County	Employment (jobs)	10	+2
	Earnings ($)	124,000	+18,300
	Revenue ($)	2,800	+400
Carbon-Emery County	Employment (jobs)	43	+6
	Earnings ($)	798,900	+118,200
	Revenue ($)	22,300	+3,300

Conclusion

Mineral-related local employment, earnings, and taxing district revenues are projected to decrease. Sediment- and salinity-related costs would decrease. Livestock operator returns above variable costs, ranch value and associated local employment, earnings, and taxing district revenues would decrease. Wildlife-related local employment, earnings, and taxing district revenues would decrease. Increased management restrictions would increase the cost of land-disturbing activities in some areas, but the net effect on the economy is unknown. The land disposals would increase taxing district revenues in Emery County by $1,000. The environmental review cost of major utility lines would decrease by $6,500 to $13,000 per mile within the utility corridors. The increased budget needed to implement this alternative would increase local employment, earnings, and taxing district revenues.

SOCIAL CONDITIONS

None of the management actions would impact local communities so far as to noticeably affect existing social conditions.

Conclusion

Social conditions of nearby communities would not be affected. The lifestyles of some ranchers would change.

ALTERNATIVE F

MINERAL COMPONENTS

Oil and Gas

Under alternative F, the area open to lease would increase by 116,140 acres compared to alternative A, but this increase would not affect production because most of the areas opened have low and moderate potential for oil and gas (appendix Q).

Leasing category acreages under alternative F compare as follows to those under alternative A.

Category	Unit	Acres	Change from Alternative A
1	SRRA	710,920	-419,360
	FPU	50,850	-920
	Subtotal	761,770	-420,280
2	SRRA	505,430	+462,300
	FPU	21,210	+2,940
	Subtotal	526,640	+465,240
3	SRRA	242,520	+73,200
	FPU	3,290	-2,020
	Subtotal	245,810	+71,180
4	SRRA	4,970	-116,140
	FPU	0	0
	Subtotal	4,970	-116,140

The category 1 and category 2 changes under alternative F would result from inclusion of seasonal restrictions to protect habitat for wildlife such as desert bighorn sheep, mule deer, and elk, and restrictions for aquatic and riparian habitat, critical soils, R&PP leases, and cultural ACECs. These restrictions would increase operating and production expenses, but are not expected to affect

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production. The area in category 2 includes areas of high, moderate, and low potential for oil and gas.

No surface occupancy (category 3) includes vegetation and scenic ACECs.

The closures to leasing (category 4) would cover the Swasey Cabin ACEC, I-70 Pictographs, and developed recreation sites. The areas that would be in categories 3 and 4 have mostly low and moderate potential for oil and gas.

Project conditions would be imposed on geophysical operations in the ACECs and the special conditions area. These conditions would not affect the miles of seismic line completed, which would be the same as for alternative A.

The production of oil and gas would be the same as in alternative A.

Conclusion

The area open to oil and gas leasing would decrease to 761,770 acres in category 1; increase to 526,640 acres in category 2; increase to 245,810 acres in category 3; and decrease to 4,970 acres in category 4. The number of miles of seismic line run per year would be 100, the same as projected under alternative A. The annual production rates would be 13,200 barrels of petroleum and 754,000 MCF of natural gas at year 2000.

Coal

Under alternative F, areas open to coal exploration (62,280 acres) would be 10 fewer acres than in alternative A, because the Rochester pictographs, which lie in the northeast portion of Emery KRCRA, would be included in the Pictographs ACEC. The I-70 Scenic Corridor ACEC (3,980 acres) would exclude exploration as in alternative A, because of the no-surface-occupancy restriction. Under current technologies, coal exploration can be effective only with some sort of drilling. This action could reduce the number of drill holes in the KRCRAs by one per year. Coal production would remain constant at 150,000 tons per year, the same as under alternative A.

The area available for coal leasing under alternative F would be 58,180 acres, 10 fewer than in alternative A because the Rochester Pictograph site would be included in the pictographs. No new surface facilities are planned for coal operations on public lands, and no new leasing is projected in the Emery Coal Field by the year 2000.

A total of 22,120 acres would be available for exploration and lease with special conditions. Because coal exploration regulations require protection of resources and full reclamation, and because leasing stipulations can be attached to limit mining to underground methods and the installation of surface facilities to minimize impacts to surface resources, these special conditions are not expected to affect coal production.

Conclusion

Under alternative F, the 62,280 acres would be available for exploration, 58,180 for lease. This reduction would not affect current coal exploration or production (150,000 tons per year).

Mineral Materials

Under alternative F, 1,216,350 acres would be open to mineral material disposal in SRRA (a decrease of 247,490 acres); 72,060 acres would be open in FPU (a decrease of 3,290 acres); for a total of 1,288,410 acres open in the planning area (a decrease of 250,780 acres) (appendix Q). Reduction of area open to disposal is due to ACECs. This decrease would not affect production, which would be the same as alternative A (320,000 cubic yards per year at year 2000), because the demand in the closed areas is low and can be supplied from adjacent open areas.

Conclusion

The area open to mineral material disposal would decrease to 1,288,410 acres.

The annual production rate would be 320,000 cubic yards at year 2000, the same as under alternative A.

Locatable Minerals

Under alternative F, 1,457,090 acres would be open to mineral entry in SRRA (a decrease of 4,970 acres) and 75,350 acres would be in open in FPU (no change), for a total of 1,532,440 acres open in the planning area (a decrease of 4,970 acres). A total of 2,150 acres with high potential for uranium (all in SRRA) would be withdrawn from mineral entry. The remainder of the withdrawn area falls into moderate, low, and no potential areas. For areas with high and moderate potential for gypsum, 760 acres (all in SRRA) would be withdrawn from entry. The remainder of the area withdrawn would be in areas of low to no potential for gypsum (appendix Q).

Under alternative F, standard conditions would be applied to 1,190,590 acres in SRRA and 72,650 acres in FPU, for a total of 1,263,240 acres in the planning area. Special conditions would be applied to 266,500 acres in SRRA and 2,700 acres in FPU, for a total of 269,200 acres in the planning area. These special conditons would apply to scenic, cultural, and vegetation ACECs and certain special recreation values. Compliance with the special conditions would be required to the extent possible without curtailing operators' rights. Filing plans of operation and complying with special conditions would increase the operators' costs, which could result in an unquantified decrease in exploration and development work. If 7,730 acres identified for land disposal were sold, the area open to mineral entry would be reduced.

Conclusion

Under alternative F, the area open to mining claim location or entry would decrease to 1,532,440 acres.

BIOTIC COMPONENTS

Soils

Under alternative F, there could be a decrease in soil loss over alternative A. This is because decreases in soil loss resulting from ORV use designations and changes in livestock management would be greater than increases resulting from lands actions.

ORV use designations as discussed under alternatives A and C may cause an estimated decrease in soil loss of between 145,130 and 1,098,250 tons per year.

A decrease in soil loss under this alternative may be due to changes in livestock grazing management. These changes are either closing areas to livestock grazing or changing the season of use. Soil loss due to livestock changes could decrease by between 647,250 and 5,157,500 tons per year. Soil loss due to the surface-disturbing activities associated with livestock related range improvements could decrease by between 550 and 4,200 tons per year.

Although there is a net decrease in soil loss under this alternative, there could be increases in soil loss associated with some activities. Estimates of soil loss are based on the amount of public land in the planning area. Disposal of public lands results in less BLM acreage available to contribute to total soil loss. Soil loss may increase due to retention of public lands disposed of under alternative A or land acquisition. Land disposal could account for a decrease in soil loss of between 6,950 and 45,780 tons per year. Land acquisition could account for an increase in soil loss of between 19,650 and 120,000 tons per year.

The soil losses contributed by other factors would continue to be as described under alternative A. Therefore, total soil loss would be between 6,483,510 and 55,198,570 tons per year (averaging 30,841,040 tons per year) by the year 2000, a decrease of between 780,230 and 6,185,730 tons per year (average decrease of 3,482,980 tons per year).

Conclusion

Total soil loss would be between 6,483,510 and 55,198,570 tons per year (averaging 30,841,040 tons per year).

Water

Surface water quality should improve under alternative F compared to alternative A. The improvement would correspond to the lower rate of soil loss that should occur under alternative F (see Soils). This is because decreases in sediment and salt yield resulting from ORV use designations and changes in livestock grazing management would be greater than increases resulting from lands actions.

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ORV use designations as described under alternatives A and C may cause an estimated decrease of between 58,050 and 439,300 tons per year of sediment and between 957 and 7,375 tons per year of salt.

A decrease in sediment and salt yield under this alternative may be due to changes in livestock grazing management. These changes are either closing some areas completely to livestock grazing or changing the season of use. Sediment yield due to changes in livestock grazing may decrease by between 258,900 and 2,063,000 tons per year. Salt yield may decrease by between 2,860 and 36,300 tons per year. Sediment and salt yield due to the surface-disturbing activities associated with livestock related range improvements could decrease by between 220 and 1,680 tons per year and by between 4 and 29 tons per year, respectively.

Although there is a net decrease in sediment and salt yield under this alternative, there could be increases in sediment and salt yield associated with some activities. Estimates of sediment and salt yield are based on the amount of public land in the planning area. Disposal of public lands results in less BLM acreage available to contribute to sediment and salt yields. Sediment and salt yield may increase due to the retention of public lands disposed of under alternative A or land acquisition. Land disposal could account for a decrease in sediment of between 2,780 and 18,310 tons per year. Salt yield could decrease by between 41 and 275 tons per year. Land acquisition could account for an increase of between 7,860 and 48,000 tons per year of sediment. Salt yield could also increase by between 123 and 838 tons per year.

Other impacts to surface and ground waters would be as described under alternative A. Total sediment yield to the Colorado River could be between 2,593,410 and 22,079,420 tons per year (averaging 12,336,415 tons per year) by the year 2000, a decrease of between 312,090 and 2,474,290 tons per year (average decrease of 1,393,190 tons per year).

Total salt yield could be between 25,731 and 387,776 tons per year (averaging 206,254 tons per year) by the year 2000, a decrease of between 3,739 and 43,141 tons per year (average decrease of 23,440 tons per year).

Conclusion

Surface water quality should improve under alternative F over alternative A. Total sediment yield to the Colorado River could be between 2,593,410 and 22,079,420 tons per year (averaging 12,336,415 tons per year) by the year 2000. Total salt yield could be between 25,731 and 387,776 tons per year (averaging 206,254 tons per year).

Ground water quality would remain as under alternative A. The level of TDS in milligrams per liter cannot be quantified.

Vegetation

Under this alternative, approximately 39,824 acres of vegetation could be disturbed by the year 2000 (short-term disturbance on 31,844 acres and long-term disturbance on 7,980 acres), a net decrease of 14,720 acres from alternative A. Less disturbance from ORV use (15,690 fewer acres) would be the primary reason. Additional short-term disturbance would be from developed recreation sites (60 acres more). Most short-term vegetation loss would be regained within a 5-year period due to natural succession or reclamation (with a site-specific seed mix). Appendix S presents forage impact analysis assumptions, and acres of anticipated surface disturbance were listed by activity in table 54.

Long-term loss would occur from additional land disposals (910 acres more than alternative A). An additional 3,200 acres would be gained through acquisition of state lands within ACEC boundaries. Anticipated changes in ecological condition under alternative F are shown in table 70.

Changes to higher seral stages would result from implementation of existing AMPs and elimination of continual spring grazing. AMPs and elimination of continual spring grazing would allow periodic rest of vegetation to recover from grazing producing a higher density of livestock forage, and changes in plant composition, thus resulting in more acres moving to a higher seral stage.

TABLE 70

Anticipated Changes in Ecological Condition, Alternative F

Ecological Condition Class	Ecological Condition by Percent of Resource Area	
	Present (1985)	Future (2000)
Potential Natural Community	9	12
Late Seral	22	22
Mid Seral	47	46
Early Seral	9	7
Rock Outcrop/Badlands	13	13

The Bowknot Bend (1,830 acres), North Big Flat Top (190 acres), and San Rafael Reef (43,870 acres) relict vegetation areas would be designated as ACECs under this alternative, whereas no such designations were identified under alternative A. The Hebes Mountain relict vegetation area would not receive special protection under alternative F.

Threatened or Endangered Plants

There would be no impact to T/E species from controlled activities. T/E plants would be protected from ORV impacts on 12,890 acres of the 18,500 acres of T/E plant habitat in the planning area. The plants would also be protected from mining disturbance by the requirement of plans of operations on 7,070 acres of T/E plant habitat. While this would not result in an increase in plants, it would provide protection for these plants.

Conclusion

Short-term vegetation loss would decrease 15,630 acres to 31,844 acres. Long-term vegetation loss would increase 910 acres to 7,980 acres. An additional 3,200 acres would be gained through acquisition of state lands. Changes to higher seral stages would result. Three relict vegetation areas would receive special protection. There would be no adverse impacts to T/E species.

Wild Horses and Burros

The wild equid range would amount to 475,680 acres of public land. Domestic livestock use would be reduced in the spring. Use during other seasons would also be limited in other areas to protect critical soils. It is expected that with the changes in livestock use, as well as forage improvements due to the removal of spring grazing, there would be forage available for wild equids, after the requirements for watershed protection and big game have been made.

Wild horses would be managed to maintain a number beween 75 and 125 head. Wild burros would range between 30 and 70 head. At the upper limits, 2,135 AUMs would be required. When the upper numbers are reached, the herds would be reduced to the lower numbers.

Conflicts in use between wild equids, livestock and big game would be resolved and adjustments in specific forage use would be made at the activity plan level, in conjunction with grazing decisions or at any time deemed necessary as a result of rangeland monitoring.

Conclusion

The wild equid range would cover 475,680 acres. Wild horses would be managed at a range between 75 and 125 head. Wild burros would be managed at a range between 30 and 70 head. When equid numbers reach the upper limits, animals would be removed to the lower limits. Forage requirements at the higher limits would be 2,135 AUMs.

Forage use levels may be adjusted for equids and livestock based on monitoring data.

Wildlife

Desert Bighorn Sheep

The crucial habitat for desert bighorn sheep would increase from 150,000 acres to 174,590 acres. This is about 24,590 acres more than under alternative A. Because of habitat restrictions limiting impacts from other resource uses and activities, the sheep would be expected to expand into protected areas. The following are specific changes to their habitat:

- Development activities would be restricted, and ORV use would be limited to designated roads and trails on 245,980 acres of yearlong habitat (83,850 acres of crucial habitat). Seasonal use restrictions would be applied to the remaining 90,740 acres of crucial habitat. With reduced stress and improved habitat conditions (assuming a 36 percent per acre population increase), these actions would result in a gain of about 110 desert bighorn sheep.

- Developments on 27,020 acres of critical watersheds within the habitat area would be restricted to those needed to better distribute the desert bighorn sheep. These would reduce the rate of increase for these animals by less than 1 percent.

- Spring and fall livestock grazing would be eliminated on seven allotments containing desert bighorn sheep habitat, and livestock AUMs would be reduced. With the additional 217 AUMs, and the reduced potential for disease transmission, desert bighorn sheep could increase by about 100 animals.

- The conflict between desert bighorn sheep and wild burros would continue to exist. The development of an HMAP for the burros would serve to reduce this conflict as much as possible on the 58,410 acres of habitat overlap.

- Offsite mitigation, which could be required on 500 acres within the crucial habitat by the year 2000, would prevent the loss of 10 desert bighorn sheep and could ultimately result in an increase of 500 animals.

Under alternative F, desert bighorn sheep would increase from 500 to about 800 animals, an increase of 300 animals over alternative A by the year 2000.

Antelope

Under alternative F, 506,660 acres of habitat would be managed to protect for antelope use. This is 340 fewer acres than under alternative A.

The following factors would allow the antelope populations to increase despite the habitat acreage reduction:

- Spring and fall livestock grazing would be eliminated on 113,830 acres. Changing the season of livestock use would allow the antelope to increase about 150 animals.

- Seasonal restrictions would be applied to development activities, and ORV use would be limited to designated roads and trails on 136,190 acres of antelope habitat. These actions would allow the antelope to increase by about 50 animals.

- Wildlife developments on 113,830 acres of antelope habitat in critical watershed areas would be limited to those needed to better distribute the antelope. This would reduce the rate of increase for the antelope by about 10 animals by the year 2000.

Under alternative F, the antelope would increase from 700 to about 900 animals, about 200 animals more than under alternative A.

Mule Deer and Elk

Crucial habitat would increase to 36,760 acres for mule deer and 18,960 acres for elk (1,260 more acres for deer and 760 more acres for elk than under alternative A), primarily because of the following factors:

- Applying protective seasonal conditions to all development activities and to ORV use would reduce stress and improve habitat conditions on about 98,450 acres of mule deer habitat and 34,890 acres of elk habitat, resulting in a 2 percent per acre population increase, or a gain of about 128 mule deer and 11 elk by the year 2000.

- Assuming an increase of one deer for every 10 acres and one elk for every 40 acres treated under the offsite mitigation requirement, offsite mitigation of 460 acres of crucial habitat would result in a gain of about 46 mule deer and 10 elk.

- Wildlife developments on 31,220 acres of mule deer habitat and 4,230 acres of elk habitat in critical watershed areas would be restricted to those needed to better distribute the mule deer and elk. These would reduce the rate of increase for these animals by about 1 percent.

- Spring and fall livestock grazing would be eliminated on 15 allotments containing mule deer and elk winter habitat; 25 percent of the AUMs would be allocated to mule deer and elk. This could allow mule deer and elk to utilize an additional 1,173 AUMs. This action would increase crucial habitat for mule deer by 800 acres and for elk by 300 acres, allowing the populations to increase by 1,560 mule deer and 115 elk.

Under alternative F, mule deer would increase from 6,620 to about 8,320 animals. This is an increase of 1,700 deer above alternative A by the year 2000. Elk would increase from 600 to about 730 animals. This is an increase of about 130 elk over alternative A.

Riparian and Aquatic Habitat

The area of riparian and aquatic habitat would increase from 14,780 acres to 14,930 acres, an increase of 150 acres from alternative A. The increase in riparian and aquatic habitat would result primarly from the following factors:

- Losses now occurring would be eliminated through protective conditions applied to all development activities, and ORV use within riparian and aquatic zones would be limited to existing roads and trails. These actions would allow for a 50-acre increase.

- Development of AMPs for livestock using riparian and aquatic habitat would allow better control and provide periodic rest to improve condition and expand riparian and aquatic habitat by 100 acres.

Threatened or Endangered Animals

The bald eagle and the peregrine falcon would benefit from improved condition of riparian habitat and its 150-acre increase to a total of 14,930 acres. The known peregrine falcon nest would be protected from development activities, recreation use, and mining claim work under this alternative. Ferruginous hawk habitat would not have special protection, but the habitat would be monitored and potential impacts mitigated. The prairie dog towns, potential black-footed ferret habitat, would be protected from potential disturbance. There would be no impact to T/E animals under this alternative.

Conclusion

Crucial habitat for desert bighorn sheep would increase to 174,590 acres, allowing a population increase to 800.

Habitat for antelope would decrease to 506,660 acres. The population would increase to 900 animals.

Crucial habitat for mule deer and elk would increase to 36,760 acres for mule deer and 18,960 acres for elk. Populations would increase to 8,320 mule deer and 730 elk.

Riparian and aquatic habitat would increase by 150 acres to 14,930 acres. There would be no adverse impacts to T/E animals.

HUMAN USES

Grazing

Grazing would be allowed on 5,800 fewer acres than in alternative A, on 91 allotments. Eight isolated allotments have been identified for disposal, and two allotments would be combined with others for improved management. Under this alternative, Bowknot Bend ACEC (1,830 acres) and the Big Flat Top ACEC (2,640 acres) would be exluded from livestock grazing. These areas are inaccessible to livestock; therefore, exclusion from grazing would not reduce areas of livestock forage. Additional areas excluded from grazing would be developed recreation sites (60 acres) and Swasey Cabin ACEC (which cattle currently use only for trailing).

Currently, livestock grazing occurs at approximately the 5-year averaged licensed use level of 55,751 AUMs; operator demand is not equal to the allowable active preference of 88,252 AUMs. It is assumed that operator demand for livestock forage will remain at the 5-year averaged licensed use level, but may increase to allowable active preference. Therefore, a range is used for analysis purposes.

Compared to alternative A, livestock AUMs may decrease by 410 for 5-year averaged licensed use and by 1,344 AUMs for active preference. The licensed use would be within the range of 55,751 to 86,198 AUMs, depending upon operator demand. This decrease can be attributed largely to the increase in land disposals (195 AUMS). Other losses would be attributed to decreasing AUMs by 25 percent on 3 allotments (1,202 AUMs) to protect critical soils and decreasing AUMs by 25 percent on 16 allotments to protect wildlife habitat (2,359 5-year averaged licensed use AUMs and 3,538 active preference AUMs). The only increase in AUMs would be due to decreased disturbance from ORVs (784 AUMs).

For analysis purposes, in allotments with 50 percent or more acres exceeding the SCS critical soil loss threshold (43 allotments), a change from spring grazing (March 15 to June 15) to winter use would be analyzed. In allotments with 25 to 49 percent of the acres exceeding this threshold (3 allotments), a 25 percent reduction of 5-year averaged licensed use and active preference AUMs would be analyzed with no change in season of use. On the allotments analyzed with a change in season to winter, a 25 percent reduction would be made on allotments where conflicts exist with wildlife (16 allotments). Additional monitoring data would be necessary before any reductions or changes of season would be made based soley on protection of these critical soils (highly saline soils and soils highly susceptible to water erosion). Therefore, any changes based on exceeding the SCS critical soil loss threshold would be made in conjunction with grazing decisions to be issued following 5 years of rangeland monitoring. These analysis assumptions are made solely to measure the possible impacts from such changes (appendixes N and T).

New AMPs would be implemented on 31 allotments, 11 existing AMPs would be modified and implemented, and 6 existing AMPs would continue. These AMPs would provide periodic rest during the grazing season to allow an increase in vigor and density of livestock forage species. Range improvements would aid in more even livestock distribution over allotments. AMPs would be managed to protect areas with critical soils, crucial wildlife ranges, and riparian areas.

Season of use would be changed from spring to winter (for analysis purposes only) use on 43 allotments. Removing cattle from these areas during the high runoff period would decrease surface disturbance and allow for increases in plant density which would reduce runoff.

Conclusion

The area available for grazing would decrease by 5,800 acres to 1,606,320 acres.

Livestock forage may decrease to 55,751 5-year averaged licensed use AUMs and to 86,198 active preference AUMs.

Forest Product Use

Under alternative F, all of the 451,200 forested acres except 570 acres would be available for collection of wood for campfire use because of restrictions in relict vegetation, cultural, and scenic ACECs (80 acres less than alternative A). Acres available for private and commercial forest product harvest would decrease to 375,300 because of relict vegetation, cultural, and scenic ACECs, and developed recreation site use restrictions. While this change in acreage would affect the available supply, adequate area remains available to meet the demand for dead wood and forest product harvest. This would exclude 75,960 acres from harvest of forest products, 60,360 more than alternative A.

Conclusion

As in alternative A, based on past use and present harvest, an adequate supply of dead wood and live forest products should be available on 375,300 acres through the year 2000.

Cultural Resources

Under alternative F, 6,707 of the estimated 70,000 cultural resources would be damaged or destroyed (28 fewer than in alternative A). Land disposals would impact 10 additional sites, while areas closed to ORV use would result in impacts to 33 fewer sites.

About 2,489 cultural resources, including 1,500 presently inventoried, would be available for use (no change from alternative A).

Conclusion

The number of cultural resources damaged or destroyed would decrease to 6,707. The number of cultural resources available for use would increase to 2,489.

Recreation

Primitive and semiprimitive recreation opportunities would increase under alternative F, while ORV access and opportunities for cross-country travel would decrease. Compared to alternative A, P class areas would increase 11,820 acres to a total of 81,500 acres; SPNM class would increase 28,290 acres to 211,700 acres; SPM class would decrease 31,950 acres to 630,920 acres; RN class would decrease 6,910 acres to 599,810 acres; and R class would decrease 40 acres to 10,630 acres. The U class would not change.

The increased demand for nonmotorized activities would probably be accommodated in existing settings; however, management actions to encourage dispersed use could be required in a few areas, possibly displacing some of the visitors to other locations outside SRRA because of the use restrictions. Commercial visitation would increase under alternative F because more of the natural and scenic values associated with commercial recreation ventures would be preserved.

A slight increase in wildlife numbers under alternative F would result in a beneficial secondary impact to recreation by increasing wildlife viewing and hunting opportunities.

Approximately 761,820 acres would be open to ORV use (a decrease of 777,370 acres from alternative A). ORV access and opportunities for cross-country travel would be slightly constrained; however, sufficient area would remain open to meet the demand for ORV use, and scenic values important to ORV recreationists would be protected. ORVs would be limited to designated roads and trails in most of the ACECs, critical soils areas, riparian and aquatic habitat, and developed recreation sites, covering 711,840 acres. ORV use would be limited by seasonal restrictions on 61,060 acres (same as alternative A; all increase from alternative A) to protect critical habitat for desert bighorn sheep, mule deer, and elk. Approximately 4,470 acres (same as alternative A; all increase from alternative A) would be closed to ORV use in the relict vegetation ACECs. Designation of scenic ACECs and management of SRMAs would focus management attention on recreation use, maintaining natural, scenic, and cultural values.

The development and expansion of recreation facilities at the San Rafael Campground, Justensen Flats, Tomsich Butte, the Wedge, and Swasey Cabin would help to meet the increased demand for motorized and nonmotorized recreation while reducing user conflicts, human waste, and trash.

Adjustments in the season of use for livestock (eliminating spring and fall use) and overall reduction of livestock numbers would increase the quality of the recreation experience.

Unusual recreation opportunities and scenic values identified in the wild and scenic rivers eligibility and potential classification study for the San Rafael River, Labyrinth Canyon (Green River), and Muddy Creek (appendix J) could be reduced with resource development in or adjacent to the canyons.

Conclusion

Under alternative F, the ROS class acreages would shift toward the resource-dependent (primitive) end of the spectrum. The P class would increase to 81,500 acres; the SPNM class would increase to 211,700 acres; the SPM class would decrease to 630,920 acres; and the RN class would decrease to 599,810 acres. The R class would decrease to 10,630 acres. The U class would remain at 20 acres.

Areas open to ORV use would decrease to 761,820 acres, reducing access and opportunities for cross-country travel. Areas where ORV use is limited by seasonal restrictions would increase to 61,060 acres; areas limited to designated roads and trails would increase to 711,840 acres; and areas closed to ORV use would increase to 4,470 acres.

Visual Resources

Alternative F would place 231,750 acres in VRM class I (all increase from alternative A). The increase includes I-70 Scenic Corridor, Muddy Creek, San Rafael Canyon, San Rafael Reef, Segers Hole, Sids Mountain, Bowknot Bend, and Big Flat Tops ACECs. No-surface-occupancy stipulations may be waived in areas managed for scenic values if an environmental assessment concludes that the proposed action would not adversely impact scenic values.

Other VRM class areas would decrease where acreage was shifted into class I. Class II would decrease 208,130 acres to 288,240 acres; class III 19,230 acres to 364,040 acres; and class IV 4,390 acres to 655,160 acres.

It is projected that in 118 cases, by the year 2000, visual contrast rating scores would exceed the VRM class objectives for that area (a decrease of 2 from alternative A projections).

Conclusion

The area in VRM class I would increase to 231,750 acres. The area in other VRM classes would decrease a corresponding amount: 208,130 acres in class II to 288,240 acres; 19,230 acres in class III to 364,040 acres; and 4,390 acres in class IV to 655,160 acres. In 118 cases (2 fewer than in alternative A), visual contrast rating scores would exceed the VRM class objectives. Through the year 2000, it is anticipated that few, if any, proposals would be received for projects in scenic areas.

Lands

Under alternative F, 24,440 acres would be designated as right-of-way corridors (21,540 acres in SRRA and 2,900 in FPU, all increase over alternative A). Lands available (standard conditions) for rights-of-way outside corridors would total 752,760 acres (704,510 in SRRA (a decrease of 708,440) and 48,250 in FPU (a decrease of 24,400 acres)). A total of 757,020 acres would be avoided (732,820 acres in SRRA (an increase of 681,930 acres) and 24,200 acres in FPU (an increase of 21,500 acres). An area of 4,970 acres (all in SRRA and all increase) would be excluded from right-of-way grants.

Lands available for disposal under alternative F would increase 910 acres over alternative A, to a total of 7,730 acres (6,730 acres in SRRA (an increase of 950 acres) and 1,000 acres in FPU (a decrease of 40 acres)). This addition would result from adding parcels for community expansion and isolated parcels not previously included that would not be needed for other surface-resource uses under this alternative.

Lands withdrawn from entry would be increased by 4,970 acres to total 6,750 acres (all SRRA). Lands would be withdrawn for developed recreation sites and the Swasey Cabin, Pictographs, Copper Globe, Bowknot Bend, and Big Flat Tops ACECs.

Lands identified for possible acquisition under alternative F total 3,200 acres of state lands (all increase and all in SRRA), within the I-70 Scenic Corridor (640 acres), The Wedge (1,280 acres), Muddy Creek (640 acres) and Big Flat Tops (640 acres) ACECs. Actual acreage could be adjusted for ease of management.

Conclusion

Corridors for right-of-way systems would be designated on 24,440 acres; lands available (standard conditions) for rights-of-way would decrease to 752,760 acres; avoided areas would increase to 757,020 acres; and excluded areas would increase to 4,970 acres. Lands available for disposal would increase to 7,730 acres. Lands withdrawn from entry would increase to 6,750 acres. Lands identified for possible acquisition would total 3,200 acres.

ECONOMIC CONSIDERATIONS

Minerals

The area covered by special conditions would increase 465,240 acres (658 percent) relative to alternative A, which would increase the cost and lower the output value of mineral exploration and development in these areas.

The Temple Mountain historical research special condition would delay mineral-related activity by one month and increase activity cost by $5,000 to $10,000. The Dry Lake Archaeological District ACEC special conditions are similar to standard operating procedures and should have little or no effect on mineral activities. The VRM class II special conditions in the central portion of San Rafael Canyon ACEC would preclude major mineral developments and may force relocation or special reclamation standards, thereby increasing the cost of smaller developments.

With effective coordination of manpower and equipment, the s [illegible] special conditions would not add to activity cost. However, the seasonal conditions could be costly (more than a 1 percent cost increase) if they idle equipment and labor. Seasonal conditions could also force demobilizing and remobilizing equipment when an exploratory well is followed up with development wells, adding more than 5 percent to development cost. This has rarely been a problem with existing seasonal stipulations.

Mineral activity costs would increase an average of 1 percent where big game offsite mitigation would be required.

Under this alternative the acreage where mineral exploration and development would essentially be excluded in the no-surface-occupancy and closed-to-resource-use-or-production areas would be less than under alternative A.

The I-70 corridor exclusion would have the greatest effect on developing and stockpiling of mineral materials. Increased two way hauling distances would average 5 miles, adding an average $2.50 per cubic yard, or approximately 25 percent, to the cost of getting mineral materials to the point of use.

Under this alternative there would be a much larger area where because of special conditions, mineral exploration and/or development would be more costly, some of which would be spent in the local economy. The reduced acreage where mineral activities would be excluded should increase mineral activity. The net effect on the local economy cannot be quantified; however, based on the assumed mineral activity projections under this alternative, the overall effect would be small.

Soil and Water

Sediment yield resulting from the surface disturbance projected under this alternative would decrease annual damage to downstream capital investments by $27,300 to $213,200 over alternative A. Salt loading resulting from the surface disturbance projected under this alternative would decrease annual damage to water users in the lower Colorado River basin by $268,164 to $2,904,800 over alternative A.

Livestock Grazing

Altogether one operator would have more available forage, 61 would have less, and available forage would remain the same for 77 operators. Forage losses and gains under the alternatives are discussed in the Grazing sections of this chapter. Changes in available forage would change rancher income by affecting herd size, weight gain, calf survival rates, or operating costs.

Of the 139 livestock operators, 89 could be excluded from using public rangeland forage at some point in the spring. The spring livestock exclusions would be of particular concern as most operators have few options with which to respond to these exclusions. Replacing forage loss through spring exclusions with hay would represent a worst-case analysis.

The number of operators affected, the degree of impact, and the related effects on local employment and earnings are presented in tables 71 and 72.

The combined effect of spring exclusions and changes in available forage would reduce operator returns above variable cost by $221,900, a 24 percent decrease.

Based on the direct effects from the budget analysis and on the indirect and induced effects derived from a county economic model, it is estimated that local employment, earnings, and taxing district revenues would decrease as shown here.

		Total	Change from Alternative A
Emery County	Employment (jobs)	148	-8
	Earnings ($)	435,400	-24,100
	Revenue ($)	302,700	-16,700
Carbon-Emery County	Employment (jobs)	229	-13
	Earnings ($)	1,046,000	-57,900
	Revenue ($)	688,400	-38,100

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TABLE 71

Number and Degree of Livestock Operator Impacts, Alternative F

	Operators with an Increase from Existing Use and Net Revenues			Operators Not Affected	Operators with a Decrease from Existing Use and Net Revenues		
	Over 51%	11 to 50%	1 to 10%		1 to 10%	11 to 50%	Over 51%
Public rangeland forage	0	0	1	77	11	44	6
Total feed requirements	0	0	1	77	55	6	0
Operator returns above variable costs	0	1	0	41	15	69	13

TABLE 72

Aggregate Economic Impacts to Livestock Operators, Alternative F

Livestock Operators	Baseline Situation	Alternative F
Gross Revenue	$2,920,700	$2,789,800
Total Variable Cost	2,008,400	2,099,500
Returns Above Variable Cost	912,200	690,300
Returns to Labor and Investment[a]	158,000	-32,400
Livestock Numbers (cattle)	9,206	8,686
(sheep)	3,761	3,776
Total Earnings, Emery County	$459,500	$435,400
Total Employment, Emery County (jobs)	156	148
Total Earnings, Carbon-Emery County	1,103,900	1,046,000
Total Employment, Carbon-Emery County	242	229

NOTE: These budgets assume that ranchers have no long-term outstanding debt, that all operating capital is borrowed, and that existing ranchers would not go out of business.

[a] Returns net of variable and fixed costs to management, non-hired labor, machinery, equipment, and land.

Any grazing permit change could affect ranch value and therefore operator wealth, particularly if the changes affect the ranch's total carrying capacity. The decrease in available forage would decrease aggregate operator wealth by $20,500, a 0.1 percent decrease.

Base properties are used as collateral for some types of loans. Since aggregate base property values are projected to decrease under this alternative, the level of total indebtedness allowed should also decrease. The operators' abilities to obtain and repay loans would change in proportion to their projected incomes.

The limitations on range improvements may increase the cost of maintaining and replacing range improvements. These limitations cannot render existing improvements uneconomic to maintain or replace; however these limitations may prevent new improvements from being installed by either outright exclusions or by rendering the projects uneconomic through special conditions.

Recreation

Recreation use of the planning area and its related local importance is projected to increase as described in alternative A. The relative mix of uses may change because of changes in recreational opportunities from alternative A (see impacts to recreation). The local economic effect of this changing mix of opportunity settings is unknown. However, judging from the existing economic importance of recreation in the planning area (less than 0.1 percent of local employment and earnings), these changes would have little effect on the local economic conditions.

Existing commercial outfitters rely heavily on the P, SPNM, and SPM opportunity settings available in the planning area. The 16 percent gain of P and SPNM, opportunity settings from alternative A could decrease the demand for outfitter services in these areas. The 5 percent loss of SPM opportunity settings could increase the demand for outfitter services in these areas. Because projected demand for commercial services is small and would comprise a small portion of any outfitters' business, these changes in opportunity settings would have little economic effect.

The additional developed recreation sites should have little or no effect on use and related local expenditures. The services offered should not compete with, and therefore not affect, privately-owned recreation developments or commercial outfitters.

There is no known relationship between special management designations and recreation use. Publicity following designation could increase public awareness of these lesser known areas, and therefore increase visitation and related local expenditures. Even if visitation to these special designation areas were doubled, the local economic effect would be insignificant. This effect, however, could be significant to outfitters who might use these areas.

Desert bighorn sheep, antelope, deer, and elk populations are projected to increase from alternative A. Assuming that population/harvest, harvest/hunter, and population/primary nonconsumptive use ratios remain constant, projected wildlife use and related expenditures would increase employment, earnings, and taxing district revenues as shown here.

		Total	Change from Alternative A
Emery County	Employment (jobs)	24	+4
	Earnings ($)	213,500	+39,200
	Revenue ($)	32,800	+6,000
Carbon-Emery County	Employment (jobs)	64	+12
	Earnings ($)	864,000	+158,600
	Revenue ($)	51,800	+9,500

Other Land Uses

Special conditions, the no-surface-occupancy stipulation, and closures to resource use and production would affect other land uses in much the same way as they affect mineral activities. Some activities within areas of restricted ORV use would require additional coordination with the BLM through a lands action which would not otherwise be required. Much of the increased costs associated with activities in special-condition and no-surface-occupancy zones would be spent in the local economy, thereby increasing local employment and earnings. However, the increased costs would also decrease the amount of other land use activity, thereby decreasing local employment and earnings. The net effect on the local economy cannot be quantified, although it is expected to be small.

The proposed land disposals would be widely scattered and would represent a 0.5 percent increase from the private land base relative to alternative A. This increase in private land base would not affect nearby land values, but would increase local taxing revenues by at least $1,000 from alternative A.

The cost of environmental review for major utility lines is typically $8,000 to $15,000 per mile. This review would cost only an estimated $1,500 to $2,000 per mile in the 26,000 acres of utility corridors proposed for designation under this alternative [Pacific Gas, 1981]. The right-of-way avoidance and exclusion areas should have little or no effect on locating major utility lines.

Plan Budget

The 36 percent increased budget over alternative A needed to implement this alternative would increase employment, earnings, and taxing district revenues as shown here.

		Total	Change from Alternative A
Emery County	Employment (jobs)	12	+3
	Earnings ($)	143,500	+37,800
	Revenue ($)	3,200	+800
Carbon-Emery County	Employment (jobs)	49	+13
	Earnings ($)	924,400	+243,600
	Revenue ($)	25,800	+6,800

Conclusion

Mineral-related employment, earnings, and taxing district revenues would not significantly change. Sediment- and salinity-related costs would decrease. Livestock operator returns above variable costs, ranch value, and associated local employment, earnings, and taxing district revenues would decrease. Wildlife-related local employment, earnings, and taxing district revenues would increase. Increased management restrictions would increase the cost of land disturbing activities in some areas, but the net effect on the local economy is unknown. The land disposals would increase taxing district revenues in Emery County by $970. The environmental review cost of major utility lines would decrease by $6,500 to $13,000 per mile within the utility corridors. The increased budget needed to implement this alternative would increase local employment, earnings, and taxing district revenues.

SOCIAL CONDITIONS

None of the management actions would impact local communities so far as to noticeably affect existing social conditions.

Conclusion

Social conditions of nearby communities would not be affected. The lifestyles of some ranchers would change.

RELATIONSHIP BETWEEN SHORT-TERM USE OF THE HUMAN ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

MINERAL COMPONENTS

Oil and Gas, Coal, Mineral Materials, and Locatable Minerals

Under alternative D, closure of some areas and application of the no-surface-occupancy stipulation in other areas would reduce the short-term production of all mineral resources; however, the long-term productivity of these resources would not be affected, since the area could be made available for development at a later date. The same would be true for locatable minerals under alternative C. Should the plan restrictions remain in place, long-term production would be lost in areas closed to mineral development activities.

BIOTIC COMPONENTS

Soils

Reductions in soil loss caused by restricting surface-disturbing activities would increase short-term soil productivity potential and vegetation conditions and productivity, as well as reduce long-term sediment and salt yield under all alternatives.

Water

Reductions in water yield (or water flow) caused by restricting surface-disturbing activities would increase short-term vegetation productivity and reduce long-term sediment and salt yield under all alternatives.

Vegetation and Riparian and Aquatic Habitat

Reductions in vegetation-disturbing activites under alternatives B, C, and D could improve vegetation conditions in the short term and vegetation productivity over the long term. Activities that cause short-term disturbances to vegetation could decrease vegetation condition and productivity in the long term. The level of potential adverse impact for vegetation would be significantly higher under alternative A than under alternative F.

Wildlife

Desert Bighorn Sheep

Short-term reductions in activities that disturb desert bighorn sheep could improve vegetation productivity and increase habitat acreage and condition, and desert bighorn sheep health and population numbers over the long term under all alternatives. Potential of disease transmission from livestock to desert bighorn sheep would be reduced in all alternatives except B.

Antelope

Short-term reductions in surface-disturbing activities could lead to long-term improvement in vegetation productivity, habitat condition, and the health and population numbers of antelope under alternatives C, D, E, and F.

Surface-disturbing activities could lead to a long-term decreased vegetation productivity, habitat acreage, habitat condition, and the health and population numbers of antelope under alternatives B and E.

Mule Deer and Elk

Short-term reductions in surface-disturbing activities could lead to long-term improvement in vegetation productivity and long-term increases in habitat acreage, habitat condition, and the health and population numbers of mule deer and elk under alternatives C, D, and F.

Surface-disturbing activities could lead to a long-term decrease in vegetation productivity, habitat acreage, habitat condition, and the health and population numbers of mule deer and elk under alternatives B and E.

Wild Horses and Burros

Short-term reductions in surface-disturbing activities could lead to a long-term increase in vegetation productivity, habitat condition, and habitat acreage, as well as a long-term increase in the health and population numbers of wild horses and burros under all alternatives.

HUMAN USES

Livestock Grazing

Short-term reductions in surface-disturbing activities could reduce the acreage available for grazing and the vegetation condition and productivity in the long term under alternatives A, C, D, E and F. The level of reduction for these alternatives does not produce a wide change from the current conditions. Reduction of level of surface-disturbing activity in the short term for alternative B has the potential to increase the available acreage for grazing and the vegetation condition and productivity in the long term under alternative B.

Reduction in surface-disturbing activities in the short term has the potential to reduce acreage available for grazing and the vegetation condition and productivity in the long term under alternatives A, C, D, E and F. The level of reduction for these alternatives does not produce a wide change from the current conditions. Reduction of level of surface-disturbing activity in the short term for alternative B has the potential to increase the available acreage for grazing and the vegetation condition and productivity in the long term under alternative B.

Cultural Resources

Increased surface-disturbing activities in the short term has the potential of damaging cultural resources in the long term.

Recreation

Reduction in surface-disturbing activities in the short term has the potential to increase the value of primitive recreation in the long term in all alternatives. Closure of areas to ORV use in the short term would cause ORV use opportunities to be lost in the long term for alternatives C and D.

Visual Resources

Reduction in surface-disturbing activities in the short term has the potential to increase the visual quality in the long term under alternatives C, D, E and F, with no change under alternative A. An increase in surface-disturbing activities in the short term would cause a loss of visual quality in the long term under alternative B.

Lands

Addition of exclusion areas in the short term would reduce the opportunity for rights-of-way and surface facilities and structures construction in the long term for alternatives B, C, D, E, and F. No loss would occur under alternative A.

IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES

Table 73 summarizes irreversible or irretrievable commitments of resources that would occur with implementation of the various alternatives.

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TABLE 73

Summary of Major Environmental Consequences and Irreversible or Irretrievable Commitments of Resources

Environmental Component	Current Base Rate	Unit	Increase from Base Rate at Year 2000, by Alternative: A	B	C	D	E	F	Commitment of Resources: Irreversible	Irretrievable
Petroleum production	0	barrels	13,200	13,200	13,200	3,000	13,200	13,200	No	Yes
Natural gas production	424,000	MCF	330,000	330,000	330,000	0	330,000	330,000	No	Yes
Coal production	150,000	tons	0	0	0	0	0	0	No	Yes
Mineral material production	210,000	cubic yards per year	110,000	110,000	110,000	0	110,000	110,000	No	Yes
Soil loss	34,324,020	average tons per year	0	0	0	0	0	0	No	Yes
Sediment yield	13,729,605	average tons per year	0	0	0	0	0	0	No	Yes
Salt yield	230,194	average tons per year	0	0	0	0	0	0	No	Yes
Vegetation disturbance	38,400	acres per year	0	0	0	0	0	0	No	No
Desert bighorn sheep crucial habitat	[a]109,600	acres lost	0	0	0	0	0	0	No	Yes
Antelope habitat	[a]507,340	acres lost	0	1,020	340	340	760	780	No	Yes
Mule deer crucial habitat	[a]35,510	acres lost	0	1,800	34,490	75,500	510	0	No	Yes
Elk crucial habitat	[a]18,200	acres lost	0	500	0	0	500	0	No	Yes

(Continued)

TABLE 73 (Concluded)

			Increase from Base Rate at Year 2000, by Alternative						Commitment of Resources	
Environmental Component	Current Base Rate	Unit	A	B	C	D	E	F	Irreversible	Irretrievable
Riparian and aquatic habitat	[a]14,770	acres lost	0	0	0	0	0	0	No	No
Wild horse and burro habitat	[a]475,680	acres lost	0	0	0	0	0	0	No	No
Livestock grazing area	[a]1,618,940	acres lost	6,820	0	81,440	28,440	7,870	7,790	No	Yes
Primitive recreation opportunities	[b]117,720	acres of lost opportunities	48,040	99,070	3,500	3,480	86,340	36,220	Yes	Yes
Motorized recreation opportunities	[b]1,539,190	acres of lost opportunities	76,500	18,650	112,700	83,260	39,190	76,110	No	Yes
Right-of-way corridors	0	acres	27,340	0	0	0	17,060	24,440	Yes	No
Exclusion areas	0	acres	0	2,030	472,820	1,281,270	1,910	4,970	Yes	No
Land disposals	8,600	acres	0	0	150	0	990	910	Yes	Yes
Lands withdrawn from entry	1,780	acres	0	2,060	472,820	1,280,290	1,910	4,970	Yes	No

NOTE: If the value under an alternative is zero, no unavoidable adverse impact is expected to occur under that alternative in comparison to the current level of management. A value greater than zero measures the level of unavoidable adverse impact occurring for that alternative.

[a] The current base rate equals acres currently available, not acres currently lost.

[b] The current base rate equals acres where opportunities are currently available.

Chapter 5

CHAPTER 5, CONSULTATION AND COORDINATION

OVERVIEW

This chapter presents information on consultation and coordination with other federal, state, and local agencies including other Bureau of Land Management (BLM) offices, as required by 40 CFR 1502.25 and 43 CFR 1610.3.

Formal plans and policies of other agencies that may have a bearing on the San Rafael Resource Management Plan (RMP) are summarized here. The proposed RMP and final environmental impact statement (EIS) will discuss whether the proposed RMP is or is not consistent with these plans.

This chapter also discusses public participation in this planning effort.

CONSULTATION

AGENCIES AFFECTED

The area covered by this RMP/EIS includes lands administered by various federal, state, and local governments. The agencies listed below were presumed to be directly affected by this plan. Agencies administering lands adjacent to the San Rafael Resource Area (SRRA) are not listed, although they may be indirectly affected by the RMP.

Department of Agriculture

Forest Service (USFS)
    Manti-LaSal National Forest (NF)
    Fishlake NF

Department of the Interior

Bureau of Land Management
    Price River Resource Area, Moab District, Utah
    Sevier River Resource Area, Richfield District, Utah
    Henry Mountain Resource Area, Richfield District, Utah
    Grand Resource Area, Moab District, Utah

National Park Service (NPS)
    Canyonlands National Park (NP)
    Capitol Reef NP
    Glen Canyon National Recreation Area (NRA)

State of Utah

Division of Lands and Forestry
    State lands

Division of Oil, Gas and Mining
    State minerals

Division of Parks and Recreation
    Goblin Valley State Park
    Green River State Park
    Huntington State Park

Division of Wildlife Resources (UDWR)

Local Governments

Emery County
    County facilities
    Law enforcement
    Land administration

City Governments
    Castle Dale
    Clawson
    Emery
    Ferron
    Green River
    Huntington
    Orangeville

Federal, state, or local agencies having management, advisory, or consultant responsibility for resources within SRRA not directly tied to specific tracts of land are discussed under Agencies Consulted or listed under Distribution, below.

AGENCIES CONSULTED

Various agencies have been consulted throughout the planning process. Information, ideas, and interpretations were exchanged through formal and informal meetings, telephone calls, and correspondence. The results of these consultations are summarized in table 74. Complete records of these contacts may be reviewed in the SRRA office.

A public workshop was held in Huntington in November 18, 1987 for the purpose of explaining the planning process and receiving public input for alternative development.

The U.S. Fish and Wildlife Service (USFWS) provided an informal consultation for the San Rafael RMP/EIS under Section 7 of the Endangered Species Act in December 1987 and April 1988. The requirement for formal consultation with the Advisory Council on Historic Preservation and the USFWS will be met by providing copies of this draft RMP/EIS to these agencies for review.

The area manager explained the planning process and the upcoming RMP to the Emery County Commission and the Green River City Council in February and April 1988.

The area manager explained the upcoming RMP to U.S. Congressman Howard Nielson in February 1988.

Informal meetings were held in February and March 1988 to brief representatives of BLM's Henry Mountain and Sevier River Resource Areas on proposed alternatives, off-road vehicle (ORV) designations, and range management practices within the upcoming RMP/EIS.

CONSISTENCY WITH OTHER PLANS

The BLM planning regulations (43 CFR 1610.3-2) require that RMPs be consistent with the plans of other federal agencies and state and local governments, so long as the RMP is also consistent with federal law and regulations governing management of the public lands. Where no formal land use plans have been developed, the RMP must be consistent with officially approved policy and programs of the other agencies.

Formal land use plans already developed or under preparation for several areas covered by the San Rafael RMP are summarized below.

DEPARTMENT OF AGRICULTURE

The USFS released management plans and EISs for all units of the Manti-LaSal and Fishlake NFs in 1986.

The USFS plans show zones for general big game winter range, grazing use by domestic livestock, and wood-fiber production and harvest. The zones are consistent with the base data used in the RMP/EIS, although treatment of public lands adjacent to the proposed USFS zones would vary by alternative in the RMP/EIS.

The USFS administers the surface over federal minerals in the planning area, while BLM manages the minerals. Both USFS plans address

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TABLE 74

Agencies Consulted

Federal Agencies	Topics Discussed
U.S. Forest Service	Visual Resource Management classes/Visual Quality objectives along BLM/Manti-LaSal National Forest boundaries.
U.S. Geological Survey	Water quality and quantity data.
Bureau of Reclamation	Current status of studies within planning area, status of salinity control projects; water quality data Price/San Rafael project.
Soil Conservation Service	Salinity control work status and data, soils data, irrigation data.
Bureau of Land Management	
Sevier River Resource Area Richfield District, Utah	Livestock, big game, and critical soils management on Sevier River allotments administered by SRRA. ORV designations on FPU.
Henry Mountain Resource Area Richfield District, Utah	Livestock, and critical soils management on Henry Mountain allotments administered by SRRA.
U.S. Fish and Wildlife Service	Threatened and endangered species.
State Agencies	Topics Discussed
Utah Department of Transportation	Mineral materials needs for State and federal highways.
Utah Division of Water Rights	Water rights information; Utah water rights allocations.
Utah Division of Wildlife Resources	Woodlands inventory information. Big game management plan status.
Utah Division of Water Resources	Watershed acreage.

(Continued)

TABLE 74 (Concluded)

County and Local Agencies	Topics Discussed
Emery County Road Department	Mineral materials needs for county road maintenance.
Emery County Water Conservancy District	Municipal water information and demand, irrigation and industrial water demand and statistics, current water use and municipal watershed concerns.
Castle Valley Special Services District	Municipal, irrigation, and industrial information and demand statistics and municipal watershed concerns and current water use.
Southeastern Utah Association of Governments	Water quality management plans under Section 208; water quality and climatic data, special recommendations and concerns for municipal watersheds.
Emery Irrigation Company	Irrigation water demand and statistics; special recommendations for municipal watersheds and concerns.
Huntington Cleveland Irrigation Company	Reservoir status; irrigation water demand and statistics, special management concerns, recommendations for municipal watersheds.

Other Organizations	Topics Discussed
Utah Power and Light Corporation	Current water use, industrial water use statistics, municipal watershed concerns.
Jensen Law Office	Muddy Creek Irrigation Project.
Utah State University	Woodland inventory information.
Johansen & Tuttle Engineering	Special management concerns and recommendations for municipal watersheds.
Mountain Fuel	Status of proposed reservoir project in Emery County.
North Emery Water Users Association	Culinary water use information.

areas of potential coal mining operations. All coal mining on the Wasatch Plateau and addressed in USFS land use plans will be by underground methods.

For coal land on Manti-LaSal NF, USFS applied the unsuitability criteria [USFS, 1986a] and then conducted a capability assessment and a multiple use management evaluation. A map prepared from all three assessments shows eight geographic areas on the Wasatch Plateau. The document [USFS, 1986b] presents issues and concerns for each of the eight areas and a narrative of conclusions as to each area's suitability for coal leasing.

Under USFS management, all other mineral activities are treated in the same manner as on public lands.

Since potential utility corridors identified in the USFS plan which adjoin planning area lands are not open to new rights-of-way, the Huntington Canyon potential utility corridor ends at the Huntington powerplant and does not extend to the forest boundary. No other potential right-of-way corridor adjoins the Manti-LaSal NF. Rights-of-way extending from the planning area into the forest are coordinated with USFS. Management is consistent with the Manti-LaSal plan. The Fishlake Land and Resource Management Plan identified the Trough Hollow planning window for potential window designation. This planning window abuts the potential corridor/window identified in the forest planning unit (FPU) and continuing into SRRA in this RMP/EIS. Management is consistent with regard to the Trough Hollow window. No transportation corridors were identified in the RMP/EIS, and management may or may not be consistent with regard to the USFS Salina Canyon window.

Since none of the lands identified for potential disposal have been identified as needed in any other agency's plans, management for disposal would be consistent.

Current USFS plans do not directly affect lands actions in the SRRA and FPU, but may do so indirectly. For example, oil and gas leases on the NFs could require access across public lands, which would require BLM action.

The USFS plans also establish recreation management areas within the NFs, according to a system very similar to, but not exactly the same as, BLM's recreation opportunity spectrum (ROS). Existing ROS classes identified by BLM are generally consistent with ROS classes identified by both Manti-LaSal and Fishlake NFs.

ORV designations identified in the USFS plan are generally consistent with the RMP/EIS alternatives. Minor variations occur along the USFS-BLM boundary; however, extreme changes in topography and elevation make these areas largely inaccessible to motorized vehicles.

The USFS plans establishes visual resource management (VRM) areas within the NFs, based on a system very similar to, but not exactly the same as, BLM's VRM system.

ENVIRONMENTAL PROTECTION AGENCY

BLM has reviewed the Environmental Protection Agency's (EPA's) concerns regarding management of air, watershed, and soil resources on public lands and incorporated them into the RMP analysis wherever possible [EPA, 1985 and 1987]. Some watershed concerns would be handled at the activity planning stage, instead of within this RMP/EIS. Site-specific concerns, such as the use of pesticides or herbicides, would be included in the National Environmental Policy Act (NEPA) documentation prepared for a specific project.

DEPARTMENT OF THE INTERIOR

National Park Service

NPS has prepared general management plans for Canyonlands NP, Capitol Reef NP, and Glen Canyon NRA, as well as activity plans covering specific resource uses in these areas.

Canyonlands National Park

Public Law 88-590, September 12, 1964, established Canyonlands NP, and Public Law 92-154, November 12, 1971, revised the park's boundaries. Although all grazing was terminated as of June 30, 1975 on lands within the original park boundaries, the Secretary issued a policy directive on February 11, 1975 allowing grazing on the lands included in the boundary until May 31, 1983 (revision in Public Law 92-154). During this time, a cooperative management agreement between NPS and BLM outlined BLM's management of grazing within the park until the phase-out was complete.

The management plan for Canyonlands NP [NPS, 1978] divides the park into different management zones. The isolated section of Canyonlands NP, entirely within the Horseshoe South Allotment, is in the park's historic zone. The affected acreage of the NP in this allotment totals approximately 6,870 acres [BLM records].

NPS has prepared activity plans to cover specific land uses within Canyonlands NP. The Natural Resource Management Plan (September 1985) and the Back Country Management Plan (December 1985) do not address uses of the adjacent public lands.

Capitol Reef National Park

The general management plan (October 1982) for Capitol Reef NP established four management zones: natural, recreation and resource utilization, development, and cultural. Lands along the NPS-BLM boundary fall into the natural zone.

Federal lands managed by NPS within the planning area are closed to mineral leasing. Capitol Reef General Management Plan does not address mineral material disposal, but indicates that an approved plan of operation would be required prior to any exploration or mining activities.

Under the Capitol Reef National Park Act, BLM is responsible for management of grazing in Capitol Reef NP. The Act contains a plan to phase out grazing in the NP by allowing the original permit holder or his heirs only one renewal of a 10-year permit. Public Law 97-341 (October 15, 1982) amended this act to allow the current permit holder or his/her heir to maintain the permit until December 31, 1994. After this date, the permit ceases to exist. The permit cannot be transferred to another party.

A portion of the Rock Springs Allotment overlaps Capitol Reef NP. The original permit holder was Carlyle Baker, who transferred grazing privileges to the Taylor-Johnson Land Company on September 26, 1972. The grazing privileges on the Rock Springs Allotment, including the portion in Capitol Reef NP, were transferred to Jeffery Ranches, Inc. on March 17, 1978. BLM issued a decision suspending grazing in the Capitol Reef NP portion of that allotment to comply with the Capitol Reef National Park Act. Jeffery Ranches, Inc. filed an appeal on March 31, 1986 (case UT-050-85-4), and an Interior Board of Land Appeals (IBLA) decision on that appeal is now pending (May, 1988). The affected acreage of the NP in this allotment totals approximately 3,310 acres [BLM records].

The Capitol Reef plan allows for maintenance of the natural setting with no development other than routine road maintenance. ORV use in these areas is limited to designated roads. The adjacent public lands in Emery County fall into the semiprimitive motorized (SPM) and roaded natural (RN) ROS classes. No conflicts have been identified with existing BLM management and designated ROS classes of adjacent areas in Emery County. Management of public lands would vary among the RMP/EIS alternatives and may or may not be consistent with NPS management.

Glen Canyon National Recreation Area

The Act of October 27, 1972, which established Glen Canyon NRA, gives BLM the responsibility to manage grazing in Glen Canyon NRA and requires consultation with NPS prior to any range improvements or proposed changes in grazing use. A portion of Glen Canyon NRA is in the Horseshoe South Allotment. The affected acreage of the NRA in this allotment totals approximately 12,810 acres [BLM records]. The mesa tops are in the recreation and resource utilization management zone, and lands below the rims are in the natural zone [NPS, 1982a].

The general management plan for Glen Canyon NRA (November 1979) established four management zones: natural, recreation and resource utilization, development, and cultural. Lands along the NRA-BLM boundary fall into the recreation and resource utilization zone. ORV use in these areas is limited to designated roads. The adjacent public lands in Emery County fall into semiprimitive nonmotorized (SPNM) and SPM ROS classes. Management of public lands would vary among the RMP/EIS alternatives and may or may not be consistent with NPS management.

The recreation and resource utilization zone permits development of mineral resources and is thus consistent with both existing BLM management and all other alternatives.

U.S. Fish and Wildlife Service

USFWS has approved recovery plans for the peregrine falcon (Rocky Mountain southwest population, 1984), the bald eagle (1983), the black-footed ferret (1978), endangered fish species in the upper Colorado River Basin (1987), and Wright Fishhook Cactus (1985). These recovery plans are consistent with BLM policy and provide guidance and information for threatened or endangered (T/E) species management.

Bureau of Land Management

RMPs have been completed for two adjacent resource areas: Grand Resource Area, Moab District, to the east, and Henry Mountain Resource Area, Richfield District, to the south. A management framework plan (MFP) was prepared for the Price River Resource Area, Moab District, to the north.

Grand Resource Area Resource Management Plan

The Grand RMP, adopted in June 1985, included management decisions for several programs. Those affecting lands along the SRRA boundary concerned utility corridors and recreation.

The potential utility corridor follows an existing 345-kilovolt power transmission line corridor. The adjacent corridor considered in this RMP/EIS aligns with that in the Grand RMP; thus management would be consistent.

Under a 1978 verbal agreement with Grand Resource Area, SRRA manages recreation use on both sides of the Green River in the Labyrinth Canyon river corridor.

Henry Mountain Resource Area Management Framework Plan

An "Interdistrict Agreement for Vegetation Allocation to Livestock, Wild Horses, Burros, and Wildlife Habitat Management between the District Manager, Richfield and the District Manager, Moab" (May 4, 1980) defines the administrative responsibility for livestock, wildlife, and wild horse and burro management; planning and EIS development; and range improvement programs on allotments overlapping district boundaries. SRRA is responsible for managing grazing on the Sweetwater (69,780 acres), Pasture Canyon (30,390 acres), and Jeffery Well (74,560 acres) allotments [acres obtained from BLM records]. Collection of ecological site inventory data for these areas is the responsibility of SRRA (completed 1985).

Price River Resource Area Management Framework Plan

The potential utility corridor follows an existing 345-kilovolt power transmission line corridor. The adjacent corridor considered in this RMP/EIS aligns with the potential corridor identified in the Price River MFP; thus management would be consistent.

Ecological site inventory was completed in 1985 on two parcels of Price River Resource Area land that were not previously inventoried (the Buckmaster Allotment (1,160 acres) and the Cleveland Summer Allotment (1,280 acres)). The grazing portion of the Price River Resource Area MFP is consistent with all alternatives in the San Rafael RMP/EIS.

The Price River Resource Area MFP prohibits major construction activities during critical time periods on occupied desert bighorn sheep range (lambing area) that adjoins the planning area. The RMP/EIS considers a similar restriction for the desert bighorn sheep habitat. Management would be consistent.

Management under the San Rafael Draft RMP would be inconsistent with the Price River Resource Area MFP on management of the Icelander antelope herd. The Price River Resource Area has completed the Grassy Trail Habitat Management Plan (HMP) on the major antelope habitat area in the Icelander herd. This inconsistency will be corrected by completion of an HMP.

STATE OF UTAH

The Utah Division of Oil, Gas, and Mining (DOGM) manages oil and gas resources on state lands. The BLM and DOGM work closely together under similar management plans.

The state does not have a comprehensive land use plan, but it did propose in Project BOLD [UDNR, 1982] to block up the pattern of state and federal land ownership. If Project BOLD is implemented, the San Rafael RMP would probably have to be amended or revised to bring it into conformance with the new ownership pattern.

In 1980 the state completed the Utah Outdoor Recreation Plan, which shows outdoor recreation use and projected increases. Recreation management on public lands within SRRA would vary by RMP/EIS alternative and may or may not allow for increased recreation use levels consistent with the state recreation plan.

Green River, Huntington, and Goblin Valley State Parks do not have current management plans. The plans are scheduled for completion in 1988.

Public Law 566 prompted watershed plans to be written for the Muddy Creek Watershed, Cottonwood Watershed, and Ferron Creek Watershed. Management of these watersheds would be consistent with these plans under all alternatives analyzed in the draft RMP/EIS.

No bighorn sheep or antelope herd managment plans have been initiated. UDWR has stated its intention to prepare elk herd management plans for the Manti and Fishlake herds. These plans will be completed by 1988.

UDWR has prepared deer herd management plans for units 29, 33, 34, 35, 36, 45, and 46. These are interagency plans, with UDWR being the lead agency and BLM contributing to the draft. These plans have been completed and await signing. The plans do not conflict with wildlife habitat management in the planning area.

LOCAL GOVERNMENTS

Emery County is in the process of producing a land use plan, scheduled for completion in December 1988. However, there are indications that the planning effort has been put on hold due to budget priorities.

The January 1984 Emery County Zoning Resolution established zones for residential, agricultural, and mining and grazing uses as well as for the county's unincorporated areas. The 1979 Revised Ordinances of Sevier County include a zoning plan for that county's unincorporated areas. The plans include zone locations and identify conforming or nonconforming uses. Most of the public land in SRRA is in the mining and grazing zone (M&G-1) and is open to oil and gas development, but companies may apply for variances in other zones. Lands actions have fallen into one of two categories: permitted nonconditional uses or permitted conditional uses. Public lands within the town of Emery fall within the residential zone (R-1) as established in the town's zoning ordinance. Small segments of public land bordering private land fall in the agricultural zone (A-1). Lands actions in these areas have been consistent with A-1 zoning. All of the public land in FPU is in the grazing, recreation, and forestry zone (GRF-1). Lands actions in this area have been consistent with GRF-1 zoning. Management of public land addressed in this draft RMP/EIS would vary by alternative and may or may not be consistent with the county plans.

Under current BLM policy, both the Emery and Sevier County Commissions and the Governor are asked to provide consistency review of each major lands action contemplated. The commissioners are invited to comment on each individual action as it relates to county development. The Governor reviews plans and planning amendments for consistency with state and local plans, policies, or programs (43 CFR 1610.3-2(e)).

Local agencies involved with use and management of the waters in municipal watershed areas were asked about watershed management concerns. They expressed some concerns about water quality, including industrial contamination, i.e., chemical spills, recreational pollution, and micro-contamination. However, they did not provide specific recommendations [Darrel Leamaster, District Manager, Castle Valley Special Services; Carly Burton, UP&L; and Howard Tuttle, Engineer, Johansen and Tuttle Engineering, personal communications, February 1988].

COORDINATION

The SRRA has coordinated with other federal, state and local governments for management of certain aspects of federal lands and resources. These are summarized here and explained more completely in the management situation analysis (MSA).

DEPARTMENT OF AGRICULTURE

BLM is responsible for issuing mineral leases and recording and adjudicating mining claims on USFS lands. USFS sets the reclamation requirements and participates in BLM's approval of applications for permit to drill (APDs) on USFS lands.

DEPARTMENT OF THE INTERIOR

National Park Service

The Act of October 27, 1972, which established Glen Canyon NRA, provided that lands within the NRA would be managed under the NPS Organic Act. The law further provided that BLM would administer the minerals and grazing leases, following the same policies used on public lands. The law withdrew lands within the NRA from mineral entry, but provided that nonleasable minerals could be leased upon preparation of suitable regulations. However, no regulatory provision has yet been made to lease locatable or salable minerals. Under current regulations and agency policy, minerals can be developed in the NRA only under an oil and gas lease. An APD for a lease on the NRA would be handled the same as APDs on USFS lands. All other federal lands managed by NPS within the planning area are closed to mineral leasing.

BLM administers livestock grazing within Capitol Reef NP on one grazing allotment (Rock Springs) consisting of 3,310 acres and within Glen Canyon NRA on one allotment (Horseshoe South) consisting of 12,810 acres. BLM consults NPS prior to approval of any range improvement.

BLM is presently (May 1988) working with NPS to develop an agreement for a joint study for potential wild and scenic river designations. This study will include all nominated areas within BLM's Moab District. The study will be completed within 5 years after completion of this RMP/EIS.

Bureau of Reclamation

Bureau of Reclamation (BOR) and Soil Conservation Service (SCS) are working on a plan to control deep water seepage and reduce irrigation return flows on the Ferron, Cottonwood, and Huntington drainages. BLM will continue working with these agencies and assist them with their plans.

BOR has a major proposal to inject saline spring and ground water from the Dirty Devil drainage system into the Coconino Formation. The drainage systems involved are Hanksville Salt Wash and Emery Salt Wash. BLM will continue to work with BOR on this proposal.

Bureau of Land Management

Interdistrict agreements between the Richfield and Moab district managers define the administrative responsibilities for management of livestock, wildlife, and wild horses and burros and development of planning documents, EISs, and range improvement programs on allotments overlapping district boundaries.

Under a 1978 verbal agreement with Grand Resource Area, SRRA manages recreation use on both sides of the Green River in the Labyrinth Canyon river corridor.

STATE AND LOCAL GOVERNMENTS

BLM cooperates with the Utah Division of Parks and Recreation to maintain interpretive facilities at Green River State Park and to manage the annual Goblin Valley trail ride and Green River canoe trip.

Management of wildlife in SRRA is covered by several agreements among BLM, USFWS, and UDWR. UDWR administers the wildlife resource and hunting; BLM manages the wildlife habitat.

The Watershed Protection and Flood Prevention Act, as amended, prompted watershed plans to be written for the Muddy Creek Watershed, Cottonwood Watershed, and Ferron Creek Watershed. Management of the watersheds would be consistent with those plans under all alternatives analyzed in the draft RMP/EIS.

Management of local roads within SRRA, excluding state and city roads, is coordinated under a 1980 memorandum of understanding between Emery County and BLM's Moab District. This agreement recognizes the county's claim to its class B roads under Revised Statute 2477 and state laws.

Management of roads in FPU is coordinated under a 1970 memorandum of understanding among Sevier County and BLM's Richfield and Fillmore Districts, and the former Price District (which is now the Moab District).

The Southeastern Utah Association of Governments has been preparing water quality management plans under Section 208 of the Water Pollution Control Act. The greatest potential for improvement in the planning area is identified as salinity control. Watershed management under all alternatives analyzed in this draft RMP/EIS would be consistent with these plans.

PUBLIC PARTICIPATION

The Federal Land Policy and Management Act of 1976 (FLPMA), the Council on Environmental Quality (CEQ) regulations, and BLM guidelines require that the planning process include public involvement. A formal call for public review and comment is required for the identification of issues (planning step 1); development of planning criteria (step 2); and the draft RMP/EIS, which documents the formulation of alternatives (step 5), estimation of effects (step 6), and selection of the preferred alternative (step 7). Provisions are made for formal public protest after selection of the final RMP (step 8). Public participation may also be made a part of the implementation of the plan (step 9) through project-specific NEPA documentation (table 2, in the Introduction to this draft RMP/EIS). The BLM will review comments and additional information supplied by the public at any stage of the planning process, and incorporate them where appropriate.

The San Rafael RMP/EIS process began with publication of a notice of intent to plan in the Federal Register on June 3, 1985. The notice listed proposed planning issues and called for public comment on those or additional issues. This met the scoping requirement found at 40 CFR 1501.7.

A preplanning analysis, which included a public participation plan, was prepared in September 1985, with a Supplement A added in June 1986 and distributed to the public to provide information about the San Rafael RMP effort.

A 30-day public comment period on the draft planning criteria ended February 22, 1986. The draft criteria were revised in response to the comments received.

Publication of this draft RMP/EIS marks the beginning of a formal public review and comment period. The public is invited to comment on any aspect of the planning process, but especially the alternatives analyzed, data considered in the description of the affected environment, the projection of estimation of effects, and selection of the preferred alternative.

The proposed RMP and final EIS will be prepared after the comments received from the public and from other agencies are reviewed. The data and conclusions originally presented in this draft RMP/EIS may be revised to accommodate additional information or public concerns. The proposed RMP may differ from the preferred alternative presented in the draft RMP/EIS as a result of public comments, the Governor's consistency review, comments of other agencies, or agency (BLM) review.

The proposed RMP as presented with the final EIS is subject to public protest through a formal procedure explained at 43 CFR 1610.5-2. The final RMP may incorporate changes resulting from either a successful protest or the Governor's consistency review.

A rangeland program summary (RPS) is required by BLM policy to brief the public on range management decisions and monitoring. The RPS will present information organized by grazing allotment and will be published along with the final RMP.

Public participation has also been used to compile information used in the MSA, the affected environment portion of the EIS, formulation of alternatives, and their analyses. Public nominations were considered in formulating a list of potential ACECs. Ranchers were interviewed to provide information used in grazing analysis. Other individuals and groups have also added to the data base for this RMP/EIS.

Monitoring and evaluation of the final RMP may result in changes to the RMP. These will be documented through plan supplements, amendments, or revisions (appendix A). Amendments and revisions will be subject to the same public participation opportunities as this RMP/EIS. Formulation of activity plans or implementation of specific projects will be open to public involvement through NEPA documentation requirements, usually through an environmental assessment (EA).

DISTRIBUTION

Copies of the draft RMP/EIS have been sent to the following individuals, organizations, industries, educational institutions, and government agencies.

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Bob and Barbara Kerr	Fruita CO
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ORGANIZATIONS

American Rivers	Washington, D.C.
American Mustang and Burro Assoc., Inc.	Liberty Hill TX
Blue Ribbon Coalition	Pocatello ID
Center for Environmental Health	Atlanta GA
Concerned Citizens Public Land Committee	Escalante UT
Deseret News	Salt Lake City UT
Director of River Protection	Washington D.C.
Hondoo Rivers and Trails	Torrey UT
Minerals Exploration Coalition	Denver CO
Moab District Grazing Advisory Board	Moab UT
Moab District Multiple Use Advisory Council	Moab UT
Moki Mac River Expeditions	Green River UT
Mountain Men of the Wasatch	Salt Lake City UT
National Mustang Association, Inc.	New Castle UT

ORGANIZATIONS (Concluded)

National Parks and Conservation Association	Salt Lake City UT
Natural Resources Defense Council	Washington D.C.
Pathfinders Motorcycle Club	Price UT
Piute Tribe of Utah	Cedar City UT
Poisonous Plant Research Lab	Logan UT
Pruitt, Gushee and Fletcher	Salt Lake City UT
Red Rock 4-Wheelers	Moab UT
Red Rock River Company	Salt Lake City UT
Rocky Mountain Oil and Gas Association	Denver CO
Salt Lake Tribune	Salt Lake City UT
Sierra Club	Phoenix AZ
Sierra Club, Cache Valley Chapter	Logan UT
Sierra Club, Utah Chapter	Salt Lake City UT
Sierra Club Legal Defense Fund, Inc.	Denver CO
Slickrock Country Council	Moab UT
Southern Utah Wilderness Alliance	Springville UT
The Nature Conservancy	Wellsville UT
Utah Professional Archaeological Council	Salt Lake City UT
Utah Trail Machine Association	Salt Lake City UT
Utah Wilderness Association	Salt Lake City UT
Ute Tribal Museum	Fort Duchesne UT
Wilderness Society	Denver CO
Wilderness Society	Salt Lake City UT
Woodward-Clyde Consultants	Denver CO

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Utah Power and Light Company	Salt Lake City UT
Wild Horse Strategic Minerals	Lexington KY
Yates Petroleum Company	Artesia NM

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Colorado University	Boulder CO
Northwestern University	Evanston IL
Price City Library	Price UT
University of Utah	Salt Lake City UT
Utah State University	Logan UT
Washington State University, Dept. of Anthropology	Pullman WA
Washington State University, Environmental Science and Regulation Planning	Pullman WA

GOVERNMENT AGENCIES

Advisory Council Historic Preservation	Denver CO
Canyonlands National Park	Moab UT
Capitol Reef National Park	Torrey UT
City of Clawson	Clawson UT

GOVERNMENT AGENCIES (Concluded)

City of Green River	Green River UT
City of Orangeville	Orangeville UT
Environmental Protection Agency	Denver CO
Environmental Protection Agency	Washington D.C.
Emery County Commission	Castle Dale UT
Federal Highway Administration	Salt Lake City UT
Fishlake National Forest	Richfield UT
Glen Canyon National Recreation Area	Page AZ
National Park Service, Rocky Mountain Regional Office	Denver CO
Office of Planning and Budget, State of Utah	Salt Lake City UT
Southeastern Utah Association of Local Governments	Price UT
State Historic Preservation Officer	Salt Lake City UT
U.S. Bureau of Land Management	Richfield UT
U.S. Forest Service, Manti-LaSal Supervisors Office	Price UT
U.S. Bureau of Reclamation	Provo UT
U.S. Bureau of Reclamation	Durango CO
U.S. Bureau of Reclamation	Grand Junction CO
U.S. Fish and Wildlife Service	Salt Lake City UT
U.S. Geological Survey	Salt Lake City UT
U.S. Geological Survey	Portland OR
U.S. Office of Surface Mining	Denver CO
U.S. Soil Conservation Service	Price UT
Utah Department of Transporation	Price UT
Utah Division of Oil, Gas and Mining	Salt Lake City UT
Utah Division of Parks and Recreation	Salt Lake City UT
Utah Division of Water Rights	Price UT
Utah Division of Water Rights	Salt Lake City UT
Utah Division of Wildlife Resources	Price UT
Utah Farm Bureau	Springville UT
Utah Resource Coordination Committee	Salt Lake City UT
Utah State Lands and Forestry	Moab UT

ELECTED OFFICIALS

Honorable Norman Bangerter, Governor	Salt Lake City UT
Honorable Omar Bunnell	Price UT
Honorable Tom Christensen	Venice UT
Honorable Duane Collard, Emery County Commission	Castle Dale UT

ELECTED OFFICIALS (Concluded)

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Honorable Jerry Mangum, Emery County Commission	Castle Dale UT
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Honorable Max Ralphs, Mayor	Ferron UT
Honorable Wade Reilly, Mayor	Clawson UT
Honorable Clyde Thompson, Emery County Commission	Castle Dale UT

EIS AVAILABILITY

Copies of this draft RMP/EIS will be available for public inspection at the BLM offices listed below:

Washington Office of Public Affairs
18th and C Streets, NW
Washington DC 20240

Utah State Office
324 South State Street
Salt Lake City, UT 84111-2303
Phone (801) 524-4227

Moab District Office
82 East Dogwood Street
Moab UT 84532-0970
Phone (801) 259-6111

Richfield District Office
150 East 900 North
Richfield UT 84701
Phone (801) 896-8221

San Rafael Resource Area
900 North 700 East
Price UT 84501
Phone (801) 637-4584

Copies may be obtained by contacting the San Rafael Resource Area office.

LIST OF PREPARERS

INTERDISCIPLINARY PLANNING TEAM

Les E. Dobson, Staff Hydrologist, prepared the alternative management actions for and analysis of impacts to air quality. Les has worked in the Moab District since 1983 and has 6 years experience in this and related jobs.

Larry K. Eyre, Chief, Minerals and Realty Staff, served as Technical Coordinator for the initial stages of the planning effort. Larry worked in SRRA from 1981 to 1987 and has 22 years experience in this and related jobs. Larry presently works in the public sector.

Stephen W. Falk, Mining Engineer, analyzed the impacts to coal resources and its use. Steve has worked in SRRA since 1983 and has 10 years experience in this and related jobs.

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Terry A. Humphrey, Outdoor Recreation Planner, prepared the alternative management actions for and analysis of impacts to recreation. Terry has worked in the Moab District office since 1980 and has 11 years experience in this and related jobs.

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David S. Orr, Range Conservationist, prepared the secton on wild horses and burros. Dave has worked in SRRA since 1975 and has 26 years experience in this and related fields.

Alan A. Partridge, Environmental Specialist, coordinated the technical tracking. He has worked on the environment project staff in BLM's Richfield District for 11 years. Prior to that he worked as a range conservationist for the Forest Service and has 27 years of related work experience.

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Acronyms

ACRONYMS AND ABBREVIATIONS

ACRONYMS

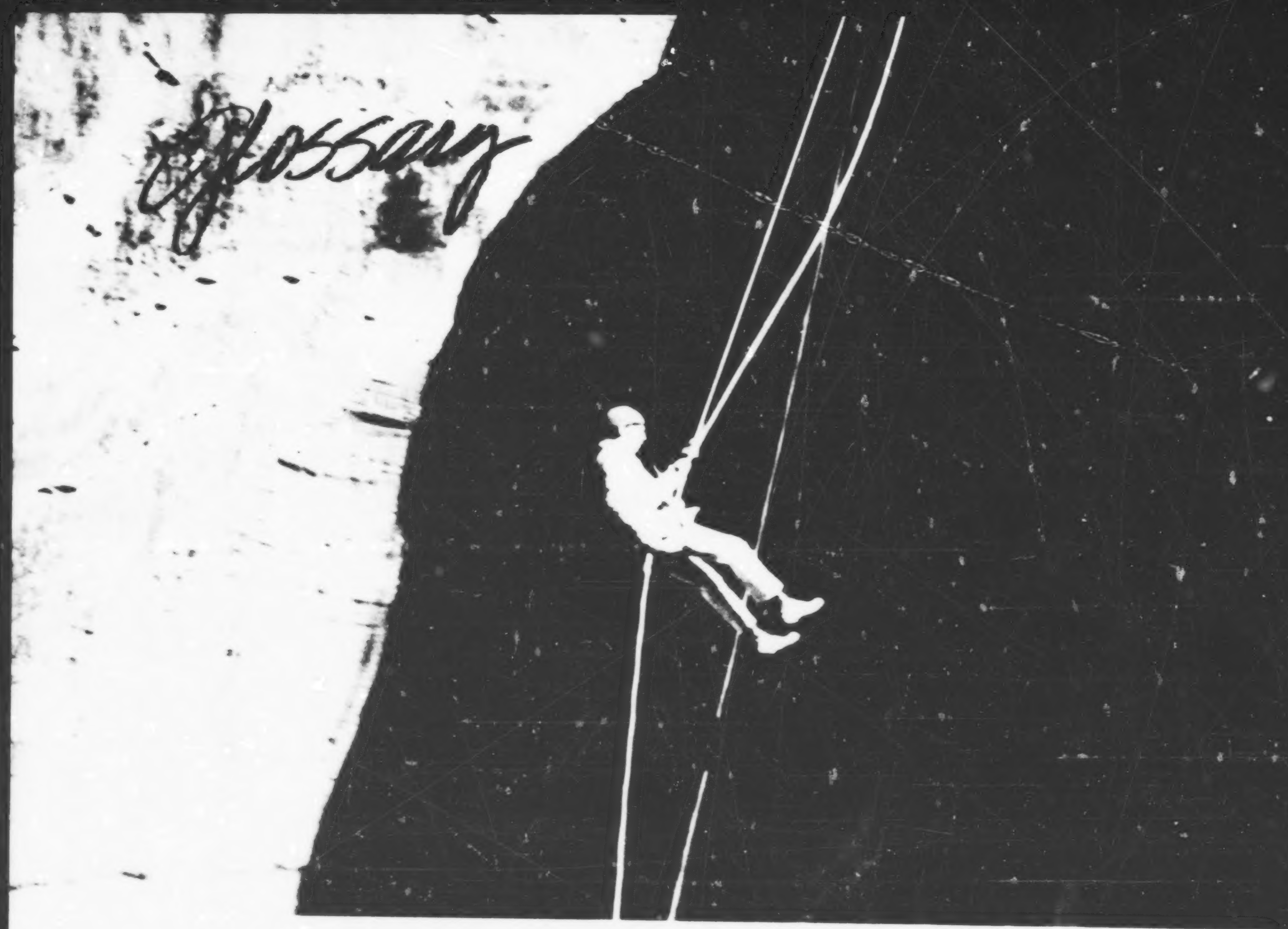
ACEC	area of critical environmental concern
AMP	allotment management plan
AMR	abandoned mine reclamation
APD	application for permit to drill
ARD	automated resource data
ARPA	Archaeological Resources Protection Act of 1979
AQRV	air quality related value
ATV	all-terrain vehicle
AUM	animal unit month
BEA	U.S. Department of Commerce, Bureau of Economic Analysis
BIA	U.S. Department of the Interior, Bureau of Indian Affairs
BLM	U.S. Department of the Interior, Bureau of Land Management
BOR	U.S. Department of the Interior, Bureau of Reclamation
C	custodial allotment management category
C&MU	Classification and Multiple Use (as in Act)
CCC	Civilian Conservation Corps
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CHL	combined hydrocarbon lease
CMA	cooperative management agreement
CO	carbon monoxide
CRMP	cultural resource management plan
CX	categorical exclusion
DOE	U.S. Department of Energy
DOGM	Division of Oil, Gas, and Mining (Utah)
DSC	Denver Service Center
E.	east
EA	environmental assessment
EIS	environmental impact statement
EPA	Environmental Protection Agency
ESIM	ecological site inventory method
F	Fahrenheit
FAA	Federal Aviation Administration
FCLAA	Federal Coal Leasing Amendment Act
FERC	Federal Energy Regulatory Commission
FLPMA	Federal Land Policy and Management Act of 1976
FPU	Forest Planning Unit, Sevier River Resource Area, Richfield District, BLM
FY	fiscal year
GIS	geographic information system
GNP	gross national product
HCRS	Heritage Conservation and Recreation Service
HMAP	herd management area plan (wild horses and burros)
HMP	habitat management plan (wildlife)
HUD	Housing and Urban Development
I	improve allotment management category
IBLA	Interior Board of Land Appeals
IMP	Interim Management Policy for Areas under Wilderness Review
IORT	Institute of Outdoor Recreation and Tourism
IP	inhalable particulate
IPP	Intermountain Power Project
ISA	wilderness instant study area
KGS	known geologic structure
KPLA	known potash lease area
KRCRA	known recoverable coal resource area

M	maintain allotment management category
MAPS	map analysis and processing system
MFP	management framework plan
MLRA	major land resource area
MOSS	MAPS overlay statistical system
MSA	management situation analysis
MSHA	Mine Safety and Health Administration
NAAQS	national ambient air quality standards
NEPA	National Environmental Policy Act
NF	national forest
NHL	national historic landmark
NM	national monument
NOAA	National Oceanic and Atmospheric Administration
NP	national park
NPS	National Park Service
NRA	national recreation area
NRDC	Natural Resources Defense Council
NRI	Nationwide Rivers Inventory
OEPR	Office of Environmental Project Review
OMB	Office of Management and Budget
ORV	off-road vehicle
OSM	Office of Surface Mining
P	primitive ROS class
PCBs	polychlorinated biphenyls
PILT	payment in lieu of taxes
P.L.	Public Law
PNC	potential natural community
PRIA	Public Rangelands Improvement Act
PRRA	Price River Resource Area
PSD	prevention of significant deterioration
PWR	public water reserve
R	rural ROS class
R.	range
R&PP	recreation and public purpose
RCRA	Resource Conservation and Recovery Act
RMA	recreation management area
RMP	resource management plan
RN	roaded natural ROS class
RO/BD	rock outcrop/badlands
ROD	record of decision
ROS	recreation opportunity spectrum
RPS	rangeland program summary
R.S.	Revised Statute
S.	south
SCS	U.S. Department of Agriculture, Soil Conservation Service
Sec.	Section
SHPO	State Historic Preservation Officer
SIC	standard industrial code
SMCRA	Surface Mining Control and Reclamation Act
SP	state park
SPM	semiprimitive motorized ROS class
SPNM	semiprimitive nonmotorized ROS class
SRRA	San Rafael Resource Area, Moab District, BLM
SRMA	special recreation management area
SSA	site-specific analysis
STSA	special tar sand area
T.	township
TDS	total dissolved solids
T/E	threatened or endangered
TSP	total suspended particulates
TSS	total suspended solids
U	urban ROS class
U.C.A.	Utah Code Annotated
UDES	Utah Department of Employment Security
UDNR	Utah Department of Natural Resources
UDOT	Utah Department of Transportation
UDWR	Utah Division of Wildlife Resources
UP&L	Utah Power and Light Company
URA	unit resource analysis
U.S.C.	United States Code
USDA	U.S. Department of Agriculture
USDC	U.S. Department of Commerce
USDI	U.S. Department of the Interior
USFS	U.S. Department of Agriculture, Forest Service
USFWS	U.S. Department of the Interior, Fish and Wildlife Service
USGS	U.S. Department of the Interior, Geological Survey
USLE	universal soil loss equation
USO	Utah State Office, BLM
VRM	visual resource management
WSA	wilderness study area

ABBREVIATIONS

ac.	acre
avg	average
Bbls	barrels
Btu	British thermal units
cfs	cubic feet per second
cu yd	cubic yards
H_2S	hydrogen sulfide
mb	millibar
MCF	thousand cubic feet
mg/l	milligrams per litre
mi	mile
mi^2	square mile
MMCF	million cubic feet
mmhos/cm	millimhos per centimeter
m/sec	meters per second
NO_2	nitrogen dioxide
NO_x	nitrous oxide
O_3	ozone
p/m	parts per million
SO_2	sulfur dioxide
T	ton
yr	year

Glossary



GLOSSARY

Acre-foot. The volume of material or water that will cover an area of 1 acre to a depth of 1 foot (43,560 cubic feet or 325,851 gallons).

Active preference. That portion of the total grazing preference for which grazing may be authorized (licensed).

Activity plan. A detailed, specific plan for management of a single resource program or plan element undertaken as necessary to implement the more general resource management plan (RMP) decisions.

Actual use. A report of the actual livestock grazing use certified accurate by the permittee or lessee. Actual use may be expressed in terms of animal unit months (AUMs) or animal months.

Affected interest. Any person, group, or organization potentially affected by a proposed action or an alternative.

Air pollution. Accumulation of aerial wastes beyond the concentrations that the atmosphere can absorb and which may, in turn, damage the environment.

Air quality classes. Classes established by the Environmental Protection Agency (EPA) that define the amount of air pollution considered significant within an area:

I almost any change in air quality would be considered significant;

II deterioration normally accompanying moderate, well-controlled growth would be considered insignificant;

III deterioration up to the national standards would be considered insignificant.

Airshed. A region within which air movement tends to be confined by topographic barriers, meteorology, and local circulations.

Alkali soil. Soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Allotment. See Grazing allotment.

Allotment management plan (AMP). A concisely written program of livestock grazing management, including supportive measures, if required, designed to attain specific management goals in a grazing allotment.

Alternatives. Different ways of addressing the planning issues and management activities considered in the planning process. These serve to provide the decision maker and the public a clear basis for choices among options.

Alluvial. Relating to or formed by water carrying and depositing rocks, soil, and other materials.

Ambient air quality. Prevailing condition of the atmosphere at a given time; the outside air. Concentration levels in the outside air for a specified pollutant and a specified averaging time period within a given area.

Animal unit month (AUM). The amount of forage necessary for the sustenance of one cow or five sheep for 1 month.

Anomaly (geologic). A geologic feature, especially in the subsurface, that is different from its general surroundings and is often of potential economic value.

Aquatic habitat. Habitat that is inundated by water with a frequency sufficient to support a prevalent form of aquatic life.

Aquifer. An underground body of rock or similar material capable of storing water and transmitting it to wells or springs (including both the saturated and unsaturated parts of the permeable unit).

Archaeological district. An area that provides a concentration of cultural properties in a discrete, definable location.

Area of Critical Environmental Concern (ACEC). An area within the public lands where special management attention is required to protect important historic, cultural, or scenic values, fish and wildlife or natural systems or processes, or to protect life and safety from natural hazards.

Average licensed use. The average number of AUMs authorized during the past 5 years. This figure depends on forage production and economics in any one year.

Avoidance area. An environmentally sensitive area where rights-of-way will be granted only in cases where there is a prevailing need and no practical alternative location exists, and then only with appropriate provisions to protect the sensitive component(s). (See Exclusion area.)

Badland. Steep to very steep barren land dissected by many intermittent drainage channels; potential runoff is very high, and erosion is active; a miscellaneous land type.

Base property. Those lands in a ranching enterprise that are owned or under long-term control of the operator and have the capability to sustain the number of livestock for a specified time period for which a grazing privilege is sought (base property requirement).

Baseline. Conditions, including trends, existing in the human environment before a proposed action is begun; a benchmark state from which all environmental consequences are forecast and all changes expected to occur under existing management are projected. (For National Environmental Policy Act (NEPA) purposes, existing management is the no-action alternative.)

Browse. As a verb, to consume or feed on (a plant); as a noun, the tender shoots, twigs, and leaves of trees and shrubs often used as food by cattle, deer, elk, and other animals.

Brush. Vegetation consisting primarily of bushes and shrubs, usually undesirable for livestock or timber management. It may sometimes be of value for browse or for watershed protection.

Butte. An isolated hill with steep sides and a top that is flat.

Candidate species (plants and animals). Species for which listing as threatened or endangered is supported by information currently on file with the U.S. Fish and Wildlife Service (USFWS) regarding biological vulnerability and threats. The candidate list is made up of species listed in categories 1 and 2 in the *Federal Register*, Vol. 50 No. 188, September 27, 1985, page 39526.

Carrying capacity (grazing). The maximum stocking rate possible without inducing damage to vegetation or related resources such as watershed. Normally expressed in terms of acres per AUM, or sometimes referred to as the total AUMs that are available in any given area, such as a grazing allotment.

Carrying capacity (recreation). The maximum number of people at one time that an area or faciltiy can accommodate without impairing the natural, cultural, or developed resource.

C&MU Classification. Lands classified under the Classification and Multiple Use Act.

Chaining. A method of vegetation treatment in which large, woody species such as pinyon and juniper are removed with a heavy chain dragged between two bulldozers.

Change agent. The apparent cause of an environmental consequence, an antecedent related empirically to an environmental consequence.

Climate. The average weather conditions of a place over a period of years.

Classification. Designation of public lands as being valuable or suitable for specific purposes, uses, or resources.

Climax vegetation. The final vegetation community that emerges after a series of successive vegetational stages. The climax community perpetuates itself indefinitely unless disturbed by outside forces. This differs from the potential natural community (PNC) in that it does not include naturalized non-native species.

Combined hydrocarbon lease (CHL). A lease issued in a special tar sand area (STSA) which entitles the lessee to remove any gas and nongaseous hydrocarbon substance other than coal, oil shale, or gilsonite.

Component. One of the structural elements of an ecosystem.

Conditional fire suppression. Current (1988) Bureau of Land Management (BLM) policy of planning fire suppression actions to minimize costs based on acceptable resource loss in certain areas.

Context. The context of an impact is explained in the Council on Environmental Quality (CEQ) regulations at 40 CFR 1508.27. It includes considerations of spatial, temporal, social, and economic factors that constitute a framework, setting, or "context" for an impact. Context defines the relative importance of an environmental consequence.

Contrast (visual). The effect of a striking difference in the form, line, color, or texture of an area being viewed.

Contrast rating. A method of determining the extent of visual impact of an existing or proposed activity that will modify any landscape feature.

Critical soils. Soils that (1) contain very highly saline soils and/or (2) are very highly susceptible to water erosion.

Critical watershed. An area of soils that (1) have a high potential for salt yield; (2) are subject to severe water and wind erosion when disturbed; (3) have high runoff potential during storm events; (4) are subject to frequent flooding; or (5) have a potential for loss of vegetation productivity under high rates of wind or water erosion.

Cropland. Land used primarily for the production of crops.

Crucial wildlife habitat. Sensitive use areas that are necessary to the existence, perpetuation, or introduction of one or more species during critical periods of their life cycles.

Cryptogamic soil. A plant that reproduces by spores instead of by seeds (e.g., mosses, algae, and fungi), which occurs on the soil surface and generally produces an irregular crust.

Cuesta. A hill or ridge with a steep face on one side and a gentle slope on the other.

Cultural clearance. A statement, based upon an inventory, that a given tract of land contains no cultural resource values or that, if cultural resources are present, compliance actions will be undertaken and other adverse impacts on them sufficiently mitigated.

Cultural property. A specific site where cultural resources are located.

Cultural resource inventory. A descriptive listing and documentation of cultural resources, including photographs and maps; included are the processes of locating, identifying, and recording sites, structures, buildings, objects, and districts through library and archival research, information from persons knowledgeable about cultural resources, and varying levels of intensity of on-the-ground field surveys. There are three classes of cultural resource inventories:

I (Existing data inventory): an inventory study of a defined area designed to provide (1) a narrative overview derived from existing cultural resource information, and (2) a compilation of existing cultural resource site record data on which to base the development of BLM's site record system.

II (Sampling field inventory): a sample-oriented field inventory designed to locate and record, from surface and exposed profile indications, all cultural resource sites within a portion of a defined area in a manner that will allow an objective estimate of the nature and distribution of cultural resources in the entire defined area.

III (Intensive field inventory): an intensive field inventory designed to locate and record, from surface and exposed profile indications, all cultural resource sites within a specified area.

Cultural resources. Those fragile and nonrenewable remains of human activities, occupations, and endeavors as reflected in sites, buildings, structures, or objects, including works of art, architecture, and engineering. Cultural resources are commonly discussed as prehistoric and historic values, but each period represents a part of the full continuum of cultural values from the earliest to the most recent.

Custodial management. A limited form of resource management employed on lands with low resource production potential that are producing near potential and where opportunities for positive economic return on public investment do not exist.

Demand. The amount of goods or services that users are willing to take at a specified price, time period, and condition of sale.

De minimis. Prevention of significant deterioration (PSD) standards for pollutants besides total suspended particulate matter (TSP) and sulfur dioxide.

Designated right-of-way corridor. A parcel of land, either linear or areal, that has been identified by law, by Secretarial Order, through the land use planning process, or by other management decision, as a preferred location for existing and future right-of-way grants and suitable to accommodate more than one type of right-of-way or one or more rights-of-way which are similar, identical, or compatible.

Direct effect. Changes in sales, employment, or income of a firm that result directly from a firm's change in output.

Directional drilling. Slant drilling or drilling at an angle. Directional drilling is sometimes utilized when the operator is not allowed to occupy the surface of a given tract of land, but still wishes to drill a structure or target beneath that tract.

Distance zone. The area that can be seen from a travel route as foreground-middleground (up to 3 to 5 miles), background (from foreground-middleground up to 15 miles), and areas which are seldom seen (or beyond 15 miles).

Drainage basin. An area bounded by a water parting and drained by a particular river and its tributaries (watershed).

Early seral. The seral stage in which a biotic community is at 0 to 25 percent of PNC; formerly known as poor condition.

Earnings. The aggregate of wage and salary disbursements, other labor income, and proprietor income.

Ecological status. The present state of vegetation of an ecological site in relation to the natural potential plant community for that site. It is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a plant community resemble that of the PNC plant community. Ecological status was formerly known as range condition.

Ecologically unique rangeland values. Plant communities that are composed of ecological sites that are relicts of a former period when these sites were more widely distributed. These plant communities usually are naturally protected and therefore have developed without the influence of grazing or human activities. These areas are scientifically valuable because there are very few relict plant communities remaining, and these relict sites can be used as comparison areas where the influence of human activities and grazing on this plant community could be evaluated.

Ecological site. A distinctive kind of rangeland that differs from other kinds of rangeland in its ability to produce a characteristic natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is capable of supporting a native plant community typified by an association of species that differs from that of other ecological sites in the kind or proportion of species or in total production. Ecological site is synonymous with range site.

Economic impact. The change, positive or negative, in economic conditions (including distribution and stability of employment and income in affected local and regional economies) that directly or indirectly result from an activity, project, or program.

Effect. Same as environmental consequence.

Employment. Labor input into a production process, measured in the number of person-years or jobs. A person-year is 2,000 working hours by one person working yearlong or by several persons working seasonally.

Endangered species (plants and animals). Species in danger of extinction throughout all or a significant portion of their ranges. See Threatened, Candidate, and Sensitive species.

Environmental consequence. A temporal or spatial change in the human environment caused by an act of man. The change should be (1) perceptible, (2) measurable, and (3) relatable through a change agent to a proposed action or alternative. A consequence is something that follows an antecedent (as a cause or agent). Consequences are synonymous with impacts and effects. In the CEQ regulations, consequences are caused by a proposed action (40 CFR 1508.7; 1508.8; 1508.14).

Ephemeral stream. A stream that flows only briefly after a storm or during snowmelt.

Equids. Members of the equidae family. In this document, wild horses and wild burros.

Erosion. The group of natural processes including weathering, dissolution, abrasion, corrosion, and transportation, by which earthy or rocky material is removed from any part of the earth's surface.

Excavation (archaeological). The scientifically controlled recovery of subsurface materials and information from a cultural site. Recovery techniques are relevant to research problems and are designed to produce maximum knowledge about the site's use, its relation to other sites and the natural environment, and its significance in the maintenance of the cultural system.

Exclusion area. An environmentally sensitive area where rights-of-way will be granted only in cases where there is a legal requirement to provide access. (See Avoidance area.)

Existing land leases. As used in this document, leases granted under the provisions of Section 302(b) of the Federal Land Policy and Management Act (FLPMA), the Recreation and Public Purpose (R&PP) Act, or the Airport Leasing Act.

Existing right-of-way corridor. A parcel of land, without fixed limits or boundaries, that is being used as the location for one or more rights-of-way.

Exotic plants. Those plant species that are not native to an area.

Fire management. The integration of fire protection, prescribed burning, and fire ecology knowledge into multiple use planning, decision making, and land management activities. Fire management is a program, not of letting fires burn, but rather of placing fire in perspective with overall land management objectives to fulfill the needs of society.

Fiscal year. The BLM planning and budgeting year, October 1 through September 30.

Five-year average licensed use. The average number of AUMs authorized during the past 5 years. In any one year, this figure depends on forage production and economics.

Flood peak. The highest value of the stage or discharge attained by a flood; thus, peak stage or peak discharge.

Floodplain. The flat ground along a stream covered by water at the flood stage for a given interval (i.e., a 500-year floodplain will be larger than a 100-year floodplain).

Forage. Vegetation of all forms available for animal consumption.

Forb. A broadleaved herb other than grass.

Formation. A distinctive layer or group of layers in a stratigraphic sequence that are most frequently tabular in shape and are mappable at the earth's surface or traceable in the subsurface.

Frequency. A quantitative expression of the presence or absence of individuals of a species in a population. It is defined as the percentage of occurrence of a species in a series of samples of uniform size.

Full fire suppression. An all-out effort to extinguish wildfires to prevent unacceptable resource damage or loss of life and property.

Geophysics. The measurement and interpretation of characteristics such as specific gravity, electrical conductivity, and magnetic susceptibility to determine the geologic properties of the earth's subsurface.

Goal. The desired state or condition that a resource management policy or program is designed to achieve. A goal is usually not quantifiable and may not have a specific date by which it is to be completed. Goals are the bases from which objectives are developed.

Grazing allotment. An area of land designated and managed for grazing livestock; such an area may include intermingled private, state, or federal lands used in conjunction with public lands.

Grazing area. As used in this document, the grazing area includes all of San Rafael Resource Area, Forest Planning Unit, and the Richfield District grazing allotments for which Moab District is responsible under a May 1980 interdistrict agreement.

Grazing preference. The total number of AUMs of livestock grazing on public lands apportioned and attached to base property owned or controlled by a permittee or lessee. Active preference and suspended preference combined make up total grazing preference.

Ground water. Water filling the unblocked pores of underlying material below the water table.

Gypsumland. Exposures of nearly pure soft gypsum, which has an unstable surface with poor trafficability and is highly erodible.

Habitat. A specific set of physical conditions that surround the single species, a group of species, or a large community. In wildlife managment, the major components of habitat are considered to be food, water, cover, and living space.

Human environment. The natural and physical environment and the relationship of people with that environment. (See complete definition in the CEQ regulations, 40 CFR 1508.14.)

Hydrocarbons. Organic chemical compounds of hydrogen and carbon atoms which form the basis of all petroleum products.

Hydrologic group D. Soils with similar runoff potentials under similar storm and surface cover conditions are grouped into four major classes (A, B, C, and D). Soils in group D have the highest runoff potentials and very slow infiltration rates when thoroughly wetted. They consist chiefly of clays and shallow soils to bedrock or hardpan.

Impact. Same as environmental consequence.

Income. Employee compensation, profits, rents, and other payments to households.

Index. A number, usually dimensionless (such as a ratio), that compares the condition of an ecosystem component or process against a standard value or against another component or process; also used in relation to thresholds, such as air or water quality standards that indicate environmental quality.

Indicator. An element of the human environment affected, or potentially affected, by a change agent. An indicator can be a structural component, a functional process, or an index. A key indicator integrates several system elements in such a way as to indicate the general health of that system.

Indirect effect. Economic impacts that result when supporting industries sell goods or services to directly affected industries or businesses.

Indirect or induced employment. Employment in all sectors of a regional economy resulting from an increase or decrease in direct employment.

Induced effect. Economic impacts that result when employees or owners of directly or indirectly affected industries spend their income within the economy.

Infrastructure. The basic transportation systems, utilities, services, enterprises, and other investments necessary for the operation and growth of a community.

Inholding. A tract of land, located within a large block of public land, that is owned by a private individual or by the State of Utah.

Input-output model. An economic model of the interdependence of the producing and consuming sectors in a given area.

Instant study area (ISA). All public lands that were formally designated as natural or primitive areas before November 1, 1975. These areas are being considered for designation as wilderness areas and, if designated, would be included in the national wilderness preservation system.

Integral vista. A viewshed, or area of view, from a pristine location, such as from a class I air quality area, that has been identified as being an important attribute to the area from which it is being viewed.

Interdisciplinary approach. Cooperative, interactive consultation and analysis among individuals representing two or more disciplines. Such an approach should "insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making, which may have an impact on man's environment" [NEPA 102(2)(A)].

Interim management policy (IMP). An interim measure governing uses on lands under wilderness review. This policy protects wilderness study areas (WSAs) from impairment of their suitability for designation as wilderness.

Intrusion (visual). A land, vegetation, or structural feature that is generally considered out of context with the characteristic landscape.

Isolated tract. A parcel of public lands surrounded by nonfederal lands.

Issue. See planning issue.

Key area. A relatively small portion of a rangeland selected because of its location, use, or grazing value as an area on which to monitor the effects of grazing use. It is assumed that key areas, if properly selected, will reflect the effects of current grazing management over all or part of a pasture, allotment, or other grazing unit.

Key management area. An area that influences or limits the management opportunities on the land surrounding it. Key management area may be synonymous with key area.

Known geologic structure (KGS). An area where an accumulation of oil or gas has been discovered by drilling and determined to be productive; the limits of the KGS include all acreage that is presumptively productive.

Known recoverable coal resource area (KRCRA). An area with coal resources that have been measured using certain data requirements and are capable of being recovered by current mining methods.

Labor force. Persons 16 years of age and older (excluding those institutionalized) who are currently employed or seeking employment.

Land disposal. A transaction that leads to the transfer of title of public lands from the Federal Government.

Land treatment. Alteration of the soil and/or vegetation of an area by mechanical, biological, or chemical means, or by burning. Land treatments are implemented to reduce erosion or improve vegetation for livestock or wildlife.

National Register of Historic Places. A list of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, and culture, maintained by the Secretary of the Interior.

National Register property. A site, district, building, structure, or object deemed significant in American history, architecture, archaeology, or culture which is listed in the National Register of Historic Places.

National Wilderness Preservation System. A system composed of federally owned areas designated by Congress as wilderness areas. These areas shall be administered for the use and enjoyment of the American people; managment actions will preserve wilderness values for future use and enjoyment.

Natural hazard. A natural characteristic of land or water resources or areas that: (1) constitutes conditions significantly dangerous, or potentially significantly dangerous, to human life, or property, or that (2) would be significantly dangerous to life or the safety of property if development or other activity were permitted. Such a hazard may be either existing or considered likely to occur in the future.

NEPA documentation. A document prepared to assess environmental impacts of a proposed action, as required by NEPA and the CEQ regulations at 40 CFR 1500. Four types of documents could be prepared, depending on the scope of the proposal: an environmental impact statement, for major actions; an environmental assessment, for actions with no significant impacts; a categorical exclusion, for certain actions predetermined to have no significant impacts; or a preemptory rejection, for projects that are not feasible from a legal or technical standpoint.

No-action alternative. The alternative under which the current management direction or level of management intensity would be continued.

Notice of intent. A notice submitted to BLM by a geophysical exploration company outlining a proposed oil and gas exploration program.

Objectives. Planned results to be achieved within a stated time period. Objectives are subordinate to goals, narrower in scope and shorter in range, and more likely to be attained. Time periods for completion are specified, as are measurable and quantifiable outputs or achievements.

Obligations. Total resource management program expenditures, including costs of the operation plan, equipment, and work months.

Off-road vehicle (ORV). Any motorized vehicle capable of or designed for travel on or immediately over land, water, or other natural terrain, excluding (1) any nonamphibious registered motorboat; (2) any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; (3) any vehicle whose use is expressly authorized by the authorizing officer, or otherwise officially approved; (4) vehicles in official use; and (5) any combat or combat support vehicle when used in times of National defense emergencies. (Quoted from Executive Order 11989.)

Palatability. The relish with which a particular species or plant part is consumed by an animal.

Paleontology. The study of fossils.

Particulate matter. Any material, except water, in a chemically uncombined form that is or has been airborne and exists as a liquid or solid at standard temperature and pressure. Minute particles of coal dust, fly ash, and oxides temporarily suspended in the atmosphere.

Pasture. As used in this document, a subdivision of a grazing allotment.

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Late seral. The seral stage in which a biotic community is at 51 to 75 percent of PNC (formerly known as good condition).

Lifestyle. The characteristic way people live, indicated by consumption patterns, work, leisure, and other activities.

Limited suppression. A policy of limiting fire suppression activity in areas where the expense associated with usual suppression procedures is not warranted (usually because of extreme suppression difficulty or because the values threatened are low).

Livestock distribution. The uniformity of livestock grazing use over a range area. It is affected by topography, availability of water, and type and palatability of vegetation.

Management facilities. Structures and other capital improvements that have been constructed to aid the administration of a resource program.

Management framework plan (MFP). A planning decision document prepared before the effective date of the regulations implementing the land use planning provisions of FLPMA.

M, I, and C categorization. The grouping of allotments into three different categories (M=maintain, I=improve, and C=custorial) for management purposes.

Midden. An accumulation of refuse about a cultural site.

Mid-seral. The seral stage in which a biotic community is at 26 to 50 percent of PNC (formerly known as fair condition).

Mineral favorability. The probability that a mineral resource actually occurs in a given area, based on the geologic environment.

Mitigating measures. Methods used (often included as stipulations or special conditions attached to a lease) to reduce the significance of or eliminate an anticipated environmental impact.

Modeling. A simulation technique for artificially imposing physical characteristics of an area onto some parameter to determine what the interaction between the parameter and the environment will be without acctually observing and measuring the interaction. Air quality modeling typically takes expected pollutant emissions from a proposed source and predicts concentrations of the pollutant in the air at various distances.

Monitoring. The orderly collection and analysis of data to evaluate progress in meeting resource management objectives. Monitoring may also include: (1) the collection of data to evaluate progress in complying with laws, regulations, policies, executive orders, and management decisions, and (2) the collection of data to assist in resource protection. Sampling of data and observation of progress toward plan objectives, the accuracy of impact analysis, and the effectiveness of mitigation measures are also of particular interest in terms of RMP monitoring activities.

Multiple use. Management of public lands and their various resource values so that they are used in the combination best meeting the present and future needs of the American people. Relative resource values are considered, not necessarily the combination of uses that will give the greatest potential economic return or the greatest unit output

Multiplier effects. The indirect and induced effects resulting from a direct effect.

National ambient air quality standards (NAAQS). National standards, established under the Clean Air Act by the Environmental Protection Agency (EPA), prescribing levels of pollution in the outdoor air which may not be exceeded. There are two levels of NAAQS: primary (set at a level to protect the public health from air pollution damage), and secondary (set at a level to protect public welfare from air pollution damage).

Payment in lieu of taxes (PILT). Payments to local or state governments based on ownership of federal land and not directly dependent on production of outputs or receipt sharing.

Pediment. A broad, flat or gently sloping, rock-floored erosion surface or plain of low relief.

Perennial stream. A stream that flows throughout the year.

Permeability (soil). The ease with which gases or liquids penetrate or pass through soil.

Permit area (coal). The area of land and water within the boundaries of a mine permit and designated on the permit application maps.

Phenology. The science concerned with periodic biological events in their relation to seasonal climatic changes. Plant phenology refers to dates of sprouting, flowering, seed production, and regrowth, as well as other observable occurrences in plant development.

Photo trend. A method of rangeland monitoring that includes taking a close-up photograph of a 3- x 3-foot plot and a general view photograph of the study site. In addition, measurements and/or estimates are made to provide quantitative data concerning vegetation characteristics that may or may not be seen in the protographs.

Pictograph. Prehistoric rock art, either drawn or painted onto a stone surface or pecked into such a surface.

Pitting. A watershed treatment in which shallow pits 5 to 20 feet wide are dug with a backhoe or bulldozer for the purpose of retaining runoff.

Placer claim. A mining claim on a surface mineral deposit formed by the mechanical concentration of mineral particles from weathered debris.

Planning area. In this document, the planning area includes both San Rafael Resource Area and the Forest Planning Unit of the Sevier River Resource Area.

Planning criteria. The standards or rules and other factors developed by the Manager and interdisciplinary team for their use in forming judgments about decision making, analysis, and data collection during planning.

Planning horizon. The period of time, expressed in years, that serves as a common base for considering future conditions and effects in the planning process.

Planning issue. A matter of controversy or dispute over resource management activities or land use that is well defined and/or topically discrete and entails alternatives among which to choose or decide.

Plan of operations. As used in this document, a plan submitted by an operator (lessee or mining claimant) which outlines in detail proposed exploration and mining activities that would disturb more than 5 acres.

Plant vigor. The relative well-being and health of a plant as reflected by its ability to manufacture sufficient food for growth and maintenance.

Potential evaporation. A measure of the degree to which the weather or climate of a region is favorable to the process of evaporation.

Potential natural community (PNC). The seral stage in which a biotic community is at 76 to 100 percent of potential.

Potential natural community vegetation. The final vegetation community that emerges after a series of successive vegetational stages. The climax community perpetuates itself indefinitely unless disturbed by outside forces.

Pot hunting. Illegal collection of artifacts, either from the land surface or by digging into an archaeological site.

Powersite. Public lands that have a potential value for water power development.

Preferred alternative. That plan alternative, in the draft environmental analysis or impact statement, which management has initially selected as offering the most acceptable resolution of the planning issues and management concerns.

Prescribed fire. The skillful application of fire to natural fuels under conditions of weather, fuel moisture, soil moisture, etc., that will allow confinement of the fire to a predetermined area and at the same time produce the intensity of heat and rate of spread required to accomplish certain planned benefits to one or more objectives of wildlife management, grazing, hazard reduction, etc. Its objective is to employ fire scientifically to realize maximum benefits at minimum damage and acceptable cost.

Primitive recreation. Nonmotorized and undeveloped types of outdoor recreation activities.

Prior stable population (wildlife). The long-term yearly average population of a herd, generated from 10-year averages of harvest data. For herds that have not stabilized, the figure represents the recommended attainable numbers that a given area can support.

Process. A mechanism whereby an ecosystem component undergoes metabolism, transformation, or any other kind of change. Any process implies an energy flow. Processes are responsible for ecosystem dynamics. They control the way components function and interact.

Propensity to consume. The proportion of a consumer's personal income that is spent on goods and services.

Proper use. (1) A degree of utilization of current year's growth which, if continued, would achieve the management objectives and maintain or improve the long-term productivity of the site; or (2) the percentage a plant is utilized when the rangeland as a whole is properly utilized. Proper use varies with time and systems of grazing. Proper use is synonymous with proper utilization.

Proprietor. Owner of an enterprise.

Public lands. Any lands or interest in lands outside Alaska owned by the United States and administered by the Secretary of the Interior through BLM, except lands located on the Outer Continental Shelf or lands held for the benefit of Indians.

Range improvement. An authorized activity or program on or relating to rangelands which is designed to improve production of forage; change vegetation composition; control patterns of use; provide water; stabilize soil and water conditions; and provide habitat for livestock, wild horses and burros, and wildlife. The term includes, but is not limited to, structures, treatment projects, and use of mechanical means to accomplish the desired results.

Rangeland. A kind of land that supports vegetation useful for grazing or browsing, on which routine management of that vegetation is through manipulation of grazing rather than cultural practices. (Rangelands include natural grasslands, marshes, riparian zones, and wet meadows. Rangeland includes lands revegetated naturally or artificially to provide a plant cover which is managed like native vegetation.)

Range site. See ecological site.

Recreation opportunity spectrum (ROS). A conceptual framework for inventory, planning, and management of recreation resources.

Rehabilitation. Restoration of damaged or lost environment as nearly as possible to its origial state.

Resource area. One of the BLM administrative areas contained in a BLM district. The two resource areas included in this document are the San Rafael Resource Area and the Sevier River Resource Area.

Resource managment plan (RMP). A written lands use plan that outlines BLM's decisions and strategies for managment of the resources in a particular area. The RMP replaces the MFP in BLM's planning system.

Rest-rotation grazing system. A grazing plan providing for systematic and sequential grazing by livestock and resting from livestock use on a range area to provide for production of livestock while maintaining or improving the vegetation and soil fertility.

Returns above cash cost. Annual sales minus those costs that must be paid that same year.

Returns to labor and investment. Annual sales minus the cost that must be paid that same year and the depreciation incurred on capital equipment.

Right-of-way. The legal right for use, occupancy, or access across land or water areas for a specified purpose or purposes. Also, the lands covered by such a right.

Right-of-way corridor. The designation of an existing group of rights-of-way capable of accommodating one or more compatible rights-of-way of like kind. Such a corridor contains only public land.

Riparian habitat. A unique, specialized form of wetland restricted to areas along, adjacent to, or contiguous with, perennially and intermittently flowing rivers, streams, and other bodies of water.

Rock outcrop. Bare, exposed bedrock consisting chiefly of sandstone, siltstone, limestone, and conglomerate.

Saline soil. Soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Salinity. A measure of total dissolved solids (TDS) including all inorganic material in solution, whether ionized or not.

Scenic corridor. In this document, the area encompassing the foreground-middleground zone along Highway I-70.

Scenic quality. The visual aesthetics of an area, based on the key factors: landforms, vegetation, color, water, influence of adjacent scenery, scarcity, and amount of cultural modification. It indicates the visual quality of an area relative to other scenery in the region. BLM ratings are A = exceptional/ extraordinary; B = moderate; and C = low/common.

Season of use. The time of livestock grazing on a range area.

Sediment. Soil or mineral material transported by water and deposited in streams or other bodies of water.

Sediment yield. The total amount of eroded material that completes the journey from its source to a downstream control point, such as a reservoir.

Segregation. Generally speaking, any action (such as withdrawal) that suspends the operation of the general public land or mineral laws on particular public lands.

Sensitive soils. Soils that are erodible, have a relatively high content of clay and silt, and are slightly to moderately saline.

Sensitive species (plants and animals). Species occurring on public lands and requiring special management attention to protect it and to prevent irreparable damage to the important resources or other natural systems or processes on which it depends. The sensitive list is made up of species listed in category 3C in the Federal Register, Vol. 50 No. 188, September 27, 1985, page 39526.

Sensitivity level (visual). An index of the response to visual change in an area based on such weighted criteria as social attitudes, amount of use, types of resource uses, management attitudes, etc. Levels are classified as high, medium, or low.

Seral community. One of a series of biotic communities that follow one another in time on any given area. Seral community is synonymous with successional community and may be synonymous with seral stage and successional stage.

Seral stage. See seral community.

Shrub. A plant that has a persistent woody stem, a relatively low growth habit, and generally produces several basal shoots instead of a single trunk.

Significance. The degree of importance as indicated by either quantitative measurements or qualitative judgments. Significant issues and impacts require explicit consideration in preparing a plan.

Sinkhole. A hole worn by water in limestone along a joint or fracture, usually connected with an underground channel.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Special condition. A requirement attached to approval of a specific project, often dealing with protection of the environment. Compare to Stipulation.

Special tar sand area (STSA). An area designated by order of the Secretary of the Interior on November 20, 1980 (45 Federal Register 76800) and January 21, 1981 (46 Federal Register 6077), and referred to in those orders as designated tar sand areas, as containing substantial deposits for tar and sand. Eleven STSAs are recognized in Utah by the Combined Hydrocarbon Leasing Act of 1981. The Act provided for the conversion of existing oil and gas leases in STSAs to CHLs. This Act also requires competitive leasing for currently unleased lands within STSAs.

Stabilization (cultural). Protective techniques usually applied to structures and ruins to keep them in their existing condition, prevent further deterioration, and provide structural safety without significant rebuilding.

Stipulation. A requirement, usually dealing with protection of the environment, that is made a part of a lease, grant, or other authorizing document.

Sublimation. The change of ice to water vapor.

Surface water. All forms of water on the surface of the earth.

Suspended preference. That portion of the grazing preference that exceeds the present available livestock grazing capacity.

Threatened species (plants and animals). Any plant or animal species likely to become endangered within the foreseeable future throughout all or a significant part of its range. See Endangered and Candidate species.

Threshold. A maximum or minimum number, or other value, for an environmental impact or resource use which, if exceeded, causes that impact or use to take on new importance. The relative importance of a threshold depends upon its context.

Topography. The relief and contour of the land, especially when taken collectively, as over a region or large area.

Total dissolved solids (TDS). All inorganic material in solution, whether ionized or not.

Total suspended particulates (TSP). All solid or semisolid material found in the atmosphere.

Trend. The direction of change in range condition (ecological status or resource value ratings) observed over time.

Unemployment. The sum of persons in the labor force who are currently unemployed but who are looking for work, and those who are on layoff or waiting to start new jobs within 30 days.

Unsuitability criteria. Criteria, specified in coal management regulations at 43 CFR 3461, that identify those lands that shall be considered unsuitable for certain stipulated methods of coal mining.

Utilization. The proportion or degree of current year's forage production that is consumed or destroyed by animals (including insects). May refer to either a single plant species, a group of species, or the vegetation as a whole. Utilization is synonymous with use.

Variable cost. A cost that varies with the level of controlled outputs in the time horizon covered by the planning period or the decisions being considered (for example, investment, operational, and variable general administration costs).

Vegetation type. A kind of existing plant community with distinguishable characteristics described in terms of the present vegetation that dominates the aspect or physiognomy of the area.

Visit (recreation). The entry of any person into a site or area of land or water generally recognized as providing outdoor recreation.

Visitor day. Twelve visitor hours which may be aggregated continuously, intermittently, or simultantously by one or more persons.

Visual distance zone. The normal distance of viewers from an area being viewed: foreground/ middleground (up to 5 miles); background (up to 15 miles); and seldom seen (more than 15 miles or areas screened from normal viewpoints).

Visual elements. The elements that determine how the character of a landscape is perceived. Form: the shapes of objects such as landforms or patterns in the landscape. Line: perceivable linear changes in contrast resulting from abrupt differences in form, color, and texture. Color: the reflected light of differnt wave lengths that enables the eye to differentiate otherwise identical objects. Texture: the visual result of variation in the surface of an object.

Visual resources. The land, water, vegetation, animals, structures, and other features that are visible on all public lands.

Visual resource management (VRM) classes. Classification containing specific objectives for maintaining or enhancing visual resources, including the amount of acceptable change to the existing landscape to meet established visual goals.

Watershed. The total area above a given point on a stream that contributes water to the flow at that point.

Water table. The upper level of an unconfined underground water body.

Wealth. The aggregate market value of an owner's assets.

Wetlands. Lands including swamps, marshes, bogs, and similar areas such as wet meadows, river overlflows, mud flats, and natural ponds.

Wilderness area. An area officially designated as wilderness by Congress. Wilderness areas will be managed to preserve wilderness characteristics and shall be devoted to the public purposes of conservation and recreational, scenic, scientific, educational, and historical uses.

Wilderness management policy. The BLM policy that governs administration of public lands designated as wilderness areas by Congress. It is based on the Wilderness Act of 1964 and FLPMA of 1976. FLPMA requires a wilderness area to be a roadless area or island that has been inventoried and found to have wilderness characteristics as described in Section 603 of FLPMA and in Section 1(c) of the Wilderness Act.

Wilderness review. The inventory, study, and reporting phases of BLM's wilderness program.

Wilderness study area (WSA). An area under study for possible inclusion as a wilderness area.

Wildlife. All species of mammals, birds, fish, amphibians, and reptiles found in a wild state.

Wildlife habitat. All elements of a wild animal's environment necessary for completion of its life cycle, including food, cover, water, and living space.

Withdrawal. An action that restricts the use of public lands and removes the land from operation of some or all of the public land or mineral laws.

Work month. A unit containing 173.3 hours of government labor.

References Cited

REFERENCES CITED

Aerocomp, Inc. 1984. Final Air Quality Analysis for the Combined Hydrocarbon EIS, Eastern and South-Central Utah. March 1984. Prepared by Aerocomp, Inc., Costa Mesa, CA. Prepared for U.S. Department of the Interior, Bureau of Land Management. Salt Lake City.

Barber, Brad T. and Taylor, Jeanine M. 1987. "1987 Population Estimates for Utah." Utah Economic and Business Review. Vol. 47, No. 12. December 1987. University of Utah, Bureau of Economic and Business Research, Graduate School of Business. Salt Lake City.

BEA. 1988. "Utah: Personal Income by Major Source and Earnings by Major Industry." April 1988. U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System. Washington D.C.

BLM. 1973. Multiple Use Management Plan for National Resource Lands, San Rafael Swell. Reprinted December 15, 1973. U.S. Department of the Interior, Bureau of Land Management. Price UT.

BLM. 1975. Environmental Assessment Record: Proposed Oil and Gas Leasing in the San Rafael Resource Area. 2 Volumes. U.S. Department of the Interior, Bureau of Land Management. Moab UT.

BLM. 1977a. Management Framework Plan, Sevier River Resource Area. U.S. Department of the Interior, Bureau of Land Management, Sevier River Resource Area. Richfield UT.

BLM. 1977b. Final Environmental Statement: Emery. U.S. Department of the Interior, Bureau of Land Management. Salt Lake City.

BLM. 1978. Unit Resource Analysis, San Rafael Resource Area. U.S. Department of the Interior, Bureau of Land Management. Price UT.

BLM. 1979a. Management Framework Plan, San Rafael Resource Area. U.S. Department of the Interior, Bureau of Land Management. Price UT.

BLM. 1979b. Final Environmental Statement: Emery Units 3 and 4. October 15, 1979. U.S. Department of the Interior, Bureau of Land Management. Salt Lake City.

BLM. 1981a. Wilderness Management Policy. U.S. Government Printing Office: 1981 O-356- 325 : QL 3. U.S. Department of the Interior, Bureau of Land Management. Washington D.C.

BLM. 1981b. Wilderness Report: Link Flats Natural Area. October 15, 1981. U.S. Department of the Interior, Bureau of Land Management. Moab UT.

BLM. 1981c. Uinta-Southwestern Utah Final Environmental Impact Statement. U.S. Department of the Interior, Bureau of Land Management. Salt Lake City.

BLM. 1983a. Price River Grazing Management Final Environmental Impact Statement. January 1983. U.S. Department of the Interior, Bureau of Land Management. Price UT.

BLM. 1983b. Final Henry Mountain Grazing Environmental Impact Statement. May 1983. U.S. Department of the Interior, Bureau of Land Management. Richfield UT.

BLM. 1983c. "Summary of Wild Horse and Burro Use." September 16, 1983. Instruction Memorandum No. 83-353. U.S. Department of the Interior, Bureau of Land Management. Washington D.C.

BLM. 1984c. Utah Combined Hydrocarbon Leasing Regional Final EIS. June 1984. Four Volumes. U.S. Department of the Interior, Bureau of Land Management: Richfield UT.

BLM. 1985b. Payments in Lieu of Taxes, Fiscal Year 1985. U.S. Department of the Interior, Bureau of Land Management, Division of Finance. Washington D.C.

BLM. 1986. Utah BLM Statewide Wilderness Draft Environmental Impact Statement. January 1986. U.S. Department of the Interior, Bureau of Land Management. Salt Lake City.

BLM. 1986a. Warm Springs Resource Area Draft Resource Management Plan and Environmental Impact Statement. April 1986. U.S. Department of the Interior, Bureau of Land Management. Richfield UT.

BLM. 1987. Salinity Control on BLM-Administered Public Lands in Colorado River Basin: A Report to Congress. July 1987. U.S. Department of the Interior, Bureau of Land Management. Washington D.C.

BLM and NPS. 1984. "Umbrella Memorandum of Understanding Between the Bureau of Land Management and the National Park Service." September 4, 1984. U.S. Department of the Interior, Robert J. Burford, Director of the Bureau of Land Management; and Russell E. Dickenson, Director of the National Park Service: Washington D.C. 3 pages.

BOR. 1980. Colorado River Salinity Economic Impacts on Agricultural, Municipal, and Industrial Users. U.S. Department of the Interior, Bureau of Reclamation. Denver CO.

Bowns, James E. and West, Neil E. 1976. Blackbrush (Coleogyne ramosissima Torr.) on Southwestern Utah Rangelands. Utah Agricultural Experiment Station Research Report 27. January 1976. Utah State University Department of Range Science. Logan UT.

Campbell, Jock A. 1977. Mineral Resource Inventory. April 1977. Prepared for U.S. Department of the Interior, Bureau of Land Management.

Castleton, Kenneth B., M.D. 1984. Petroglyphs and Pictographs of Utah. Volume One: The East and Northeast. Utah Museum of Natural History. Salt Lake City.

Cory, Dennis and Martin, William. 1985. "Valuing Wildlife for Multiple Use: Elk versus Cattle." Western Journal of Agricultural Economics. Vol. 10, No. 2. Pages 282-293.

Coulam, Nancy, et al. 1983. Class I Cultural Resource Inventory for the Moab District of the Bureau of Land Management. Part I: Cultural Resource Overview. July 27, 1983. MESA CRM Paper No. 10. Contract No. YA-553-CTO-1060. Prepared by MESA Corporation, 1156 South State Street, Suite 206. Orem UT. Prepared for U.S. Department of the Interior, Bureau of Land Management, Moab UT.

Dalton, Michael. 1982. Outdoor Recreation in Utah: The Economic Significance. Prepared by Utah State University, College of Natural Resources, Institute for Outdoor Recreation and Tourism. Logan UT. Prepared for Utah Division of Parks and Recreation. Salt Lake City.

Dissmeyer, George E. 1981. "Developing a USLE Cover-Management (C) Factor Procedure for Forest Conditions." Professional paper presented at Universal Soil Loss Equation Workshop. Tucson, AZ. U.S. Department of Agriculture, Forest Service, Southeastern Area. Atlanta GA.

Doelling, H.H. 1972. Central Utah Coal Fields: Sevier-Sanpete, Wasatch Plateau, Book Cliffs and Emery. Monograph Series No. 3. Prepared for Utah Geological and Mineralogical Survey, affiliated with the College of Mines and Mineral Industries, University of Utah. Salt Lake City.

Drabenstott, Mark and Duncan, Marvin. 1984. "Another Troubled Year for U.S. Agriculture." Economic Review. December 1984. ISSN 0161- 2387. Federal Reserve Bank of Kansas City MO.

EPA. 1985. Scoping comments for the BLM San Rafael RMP/EIS. Memorandum dated December 18, 1985. From U.S. Environmental Protection Agency, Region VIII. Denver CO. On file in San Rafael Resource Area office.

EPA. 1987. Checklist for reviewing BLM RMP/EIS. Memorandum dated April 8, 1987. Reference: 8M-EPB. From U.S. Environmental Protection Agency, Region VIII. Denver CO. On file in San Rafael Resource Area office.

Federal Reserve Bank of Kansas City. 1987. Economic Review. April 1987. Vol. 72, No. 4. Federal Reserve Bank of Kansas City MO.

Finken, Dee Anne. 1977. A History of the San Rafael Swell. September 1977. Prepared by Western Interstate Commission for Higher Education, Resources Development Internship Program. Prepared for U.S. Department of the Interior, Bureau of Land Management. Price UT.

Fletcher, James E. and King, Michael. 1987. Attitudes Concerning and Use of Fish and Wildlife Resources in the State of California. June 6, 1987. Final Report by the Survey Research Center, University Foundation, California State University, Chico CA; for the Department of Fish and Game, State of California, Sacramento.

Gee, C. Kerry, et al. 1986. "Enterprise Budgets for Livestock Businesses that Use Bureau of Land Management Grazing Land." Working Paper WP:86-1. Colorado State University, Department of Agricultural and Natural Resource Economics. Fort Collins CO.

Hansen, David T. 1986. San Juan County Soil Survey, San Juan County, Utah. Draft manuscript prepared for U.S. Department of Agriculture, Soil Conservation Service: Moab UT.

Hansen, R.H., et al. 1986. Annual Report of the Utah State Tax Commission. Fiscal Year July 1, 1985 to June 30, 1986.

Hare, Tom and Day, Max. 1986. "Safety Hazards and Hazardous Wastes in the San Rafael Resource Area." Unpublished Staff Report. U.S. Department of the Interior, Bureau of Land Management. Moab UT.

Hauck, F.R. 1979. Cultural Resource Evaluation in Central Utah, 1977. Cultural Resource Series No. 3. Contract No. 14-08-0001-16479. Prepared for U.S. Department of the Interior, Bureau of Land Management. Salt Lake City.

Hawley, C.C., et al. 1965. Geology and Uranium Deposits of the Temple Mountain District, Emery County, Utah. USGS Bulletin 1192. Prepared by U.S. Department of the Interior, Geological Survey. Washington, D.C. Prepared for U.S. Atomic Energy Commission.

Hawley, C.C., et al. 1968. Geology, Altered Rocks and Ore Deposits of the San Rafael Swell, Emery County, Utah. USGS Bulletin 1239. Prepared by U.S. Department of the Interior, Geological Survey. Washington, D.C. Prepared for U.S. Atomic Energy Commission.

Hof, John G. and Kaiser, H. Fred. 1983a. "Long-term Outdoor Recreation Participation Projections for Public Land Management Agencies." Journal of Leisure Research. Volume 15, No. 1. First Quarter 1983. National Recreation and Park Association.

IORT. 1984. "Final Estimated Economic Impact of Travel and Tourism in Utah for 1984." Utah State University, College of Natural Resources, Institute for Outdoor Recreation and Tourism. Logan UT.

Jackson, William L. and Julander, Randall P. 1982. "Runoff and Water Quality from Three Soil Landform Units on Mancos Shale." Water Resources Bulletin, Vol. 18, No. 6. December 1982. American Water Resources Association.

Jennings, Jesse D. 1978. Prehistory of Utah and the Eastern Great Basin. Number 98. University of Utah Anthropological Papers. University of Utah Press. Salt Lake City.

Jense, Grant K., et al. 1986. Utah Big Game Annual Report. June 24, 1986. Publication No. 86-3. Utah Division of Wildlife Resources. Salt Lake City.

Kellert, Stephen R. and Berry, Joyce K. 1985. A Bibliography of Human/Animal Relations. Yale University, School of Forestry and Environmental Studies. University Press of America: Lanham MD.

King, N.J. and Mace, M.M. 1953. Sedimentation in Small Reservoirs on the San Rafael Swell, Utah. Geological Survey Circular 256. U.S. Department of the Interior, Geological Survey. Washington D.C.

Kleinman, A.P., et al. 1974. Economic Impacts of Changes in Salinity Levels of the Colorado River. U.S. Department of the Interior, Bureau of Reclamation.

Kleinman, A.P. and Brown, Bruce F. 1980. Colorado River Salinity Economic Impacts on Agricultural, Municipal, and Industrial Users. U.S. Department of the Interior, Bureau of Reclamation, Colorado River Water Quality Office.

Krannich, Richard S. and Cundy, Donald T. 1987. Utah Residents' Opinions About Wildlife and Resource Management. February 10, 1987. Project Summary Report submitted to the State Advisory Council on Science and Technology.

Leatham, Jon P., et al. 1986. Utah Cougar Harvest, 1984-85. February 1985. Publication No. 86-1. Annual Performance Report for Federal Aid Project No. W-65-R-D-33, Job A-7. Utah Department of Natural Resources, Division of Wildlife Resources. Salt Lake City.

Leatham, Jon P. and Roberson, Jay A. 1985. Utah Upland Game Annual Report: 1985. Publication No. 86-7. Annual Performance Report for Federal Aid Project W-65-R-34, Job A-4. Utah Department of Natural Resources, Division of Wildlife Resources. Salt Lake City.

Loomis, John B., et al. 1985. Net Economic Value of Hunting Unique Species in Idaho: Bighorn Sheep, Mountain Goat, Moose, and Antelope. Resource Bulletin RM-10, Rocky Mountain Forest and Range Experiment Station, U.S. Forest Service, Fort Collins CO.

Lusby, Gregg C. 1970. "Hydrologic and Biotic Effects of Grazing vs. Non-Grazing Near Grand Junction, Colorado." Journal of Range Management. Vol. 23, No. 4. Pages 256-260.

Lusby, Gregg C., et al. 1971. Effects of Grazing on the Hydrology and Biology of the Badger Wash Basin in Western Colorado, 1953-66. Geological Survey Water-Supply Paper 1532-D. Prepared in collaboration with the U.S. Department of Agriculture, Forest Service; U.S. Department of the Interior, Fish and Wildlife Service, Bureau of Land Management, and Bureau of Reclamation. U.S. Department of the Interior, Geological Survey. Washington, D.C.

Mason, Lamar R. 1978. Soil Losses from Utah Rangeland and Forestland. June 1978. U.S. Department of Agriculture, Soil Conservation Service. Salt Lake City.

McNulty, Irving and Harper, Kelly. 1966. Letter to BLM Utah State Director dated November 2, 1966.

NPS. 1978. General Management Plan, Canyonlands National Park, Utah. U.S. Department of the Interior, National Park Service, Denver Service Center. Denver CO.

NPS. 1979. Proposed General Management Plan, Wilderness Recommendation, Road Study Alternatives, and Final Environmental Statement for Glen Canyon National Recreation Area. July 1979. U.S. Department of the Interior, National Park Service, Washington, D.C. (Approved as final November 21, 1979: 44 Federal Register 226, page 66996.)

NPS. 1982a. General Management Plan, Final Environmental Impact Statement, Statement of Findings: Capitol Reef National Park/Utah. October 1982. U.S. Department of the Interior, National Park Service. Washington D.C.

NPS. 1982b. The Nationwide Rivers Inventory. January 1982. U.S. Department of the Interior, National Park Service, Washington D.C.

NPS and BLM. 1984. Draft Environmental Impact Statement on Conversion of Oil and Gas Leases to Combined Hydrocarbon Leases, Tar Sand Triangle, Utah. July 16, 1984. U.S. Department of the Interior, National Park Service Rocky Mountain Regional Office, Denver CO; and Bureau of Land Management Utah State Office, Salt Lake City.

Pacific Gas. 1981. Federal Land Use Regulations Adversely Affecting the Western Utility Industry. June 1981. Published for the Western Utility Group by Pacific Gas and Electric Company: San Francisco CA.

Provan, Timothy H, et al.. 1980. Utah Furbearer Harvest Report and Management Recommendations. August 1980. Publication No. 80-12. Performance Report for Federal Aid Project No. W-65-R-28, Job A-3. Utah Department of Natural Resources, Division of Wildlife Resources. Salt Lake City.

Schaafsma, Polly. 1971. The Rock Art of Utah: A Study from the Donald Scott Collection. Vol. 65. Papers of the Peabody Museum of Archaeology and Ethnology. Harvard University. Cambridge MA.

Schumm, S.A. and Gregory, D.I. 1987. Diffuse-Source Salinity: Mancos Shale Terrain. Technical Note 373. Contract No. CO-910-PH5-591. U.S. Department of the Interior, Bureau of Land Management. Denver CO. 169 pages.

Shalloof, Faisal M. 1985. "Impact of Various Factors upon Benefits from Big-Game Hunting Estimated by the Travel Cost Method." Ph.D. dissertation. Oregon State University: Corvallis.

Smith, Gary. 1980. "Utah's Rock Art Wilderness Louvre." National Geographic. Vol. 157, No. 1. January 1980. Pages 97 to 117.

Spieker, Edmund M. 1931. The Wasatch Plateau Coal Field, Utah. Bulletin 819. U.S. Department of the Interior, Geological Survey. Washington D.C.

Standard Research, Inc. 1987. Coloradans' Perception of the Nongame Program in Colorado. July 1987. Colorado Division of Wildlife, Denver.

Tittman, Paul P. and Brownell, Clifton E. 1984. Appraisal Report for Estimating Fair Market Rental Value of Public Rangelands in the Western United States Administered by USDA-Forest Service and USDI-Bureau of Land Management. July 27, 1984. PB84-242205. Prepared for U.S. Forest Service and Bureau of Land Management. Denver CO.

Trimble, Larry M. and Doelling, Hellmut H. 1978. Geology and Uranium-Vanadium Deposits of the San Rafael River Mining Area, Emery County, Utah. Bulletin 113. July 1978. Prepared for Utah Department of Natural Resources, Geological and Mineral Survey.

UDES. 1986. "Utah Nonagricultural Payroll Employment by Standard Industrial Classification." Utah Labor Market Information. Utah Department of Employment Security, Salt Lake City.

UDNR. 1982. Project Bold: Alternatives for Utah Land Consolidation Exchange. September 20, 1982. Utah Department of Natural Resources and Energy: Salt Lake City. 265 pages.

UDOT. 1971. Materials Inventory: Carbon and Emery Counties. Revised August 1971. Utah Department of Highways, Division of Materials and Research, Materials Inventory Section.

UDWR. 1986. 1985 Waterfowl Harvest Report. Utah Division of Wildlife Resources, Salt Lake City.

USDA and USDI. 1977. Study of Fees for Grazing Livestock on Federal Lands: A Report from the Secretary of the Interior and the Secretary of Agriculture. October 21, 1977. Stock No. 024-011-00087-9, Superintendent of Documents, U.S. Government Printing Office. Washington D.C.

USDC. 1982. U.S. Census of Agriculture: 1982. July 1984. Final Report, Vol. 1, Geographic Area Series; Part 44, Utah. U.S. Department of Commerce, Bureau of the Census. Washington D.C.

USDC. 1984a. 1982 Census of Agriculture. Volume 1, Geographic Area Series, Part 44, Utah State and County Data. Issued July 1984. U.S. Department of Commerce, Bureau of the Census: Washington D.C.

USDC. 1984b. 1982 Census of Retail Trade, Geographic Area Series: Utah. July 1984. RC82-A-45. U.S. Department of Commerce, Bureau of the Census: Washington D.C.

USDC. 1984c. 1982 Census of Wholesale Trade, Geographic Area Series: Utah. July 1984. WC82-A-45. U.S. Department of Commerce, Bureau of the Census. Washington D.C.

USDC. 1984d. 1982 Census of Service Industries, Geographic Area Series: Utah. SC82-A-45. U.S. Department of Commerce, Bureau of the Census: Washington D.C.

USDC. 1985. 1982 Census of Construction Industries, Geographic Area Series: Mountain States. April 1985. CC 82-A-8. U.S. Department of Commerce, Bureau of the Census: Washington D.C.

USDC. 1985a. Emery County, Utah, Personal Income by Major Sources. Table 5.00. April 1985. U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System. Washington D.C.

USDC. 1985b. Carbon County, Utah, Personal Income by Major Sources. Table 5.00. April 1985. U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System. Washington D.C.

USDC. 1985c. Sevier County, Utah, Personal Income by Major Sources. Table 5.00. April 1985. U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System. Washington D.C.

USDC. 1985d. Sanpete County, Utah, Personal Income by Major Sources. Table 5.00. April 1985. U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System. Washington D.C.

USDC. 1985e. Emery County, Utah: Employment by Type and Broad industrial Sources. April 1985. U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System. Washington D.C.

USDC. 1985f. Carbon County, Utah: Employment by Type and Broad industrial Sources. April 1985. U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System. Washington D.C.

USDC. 1985g. Sevier County, Utah: Employment by Type and Broad industrial Sources. April 1985. U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System. Washington D.C.

USDC. 1985h. Sanpete County, Utah: Employment by Type and Broad industrial Sources. April 1985. U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System. Washington D.C.

USFS. 1982. IMPLAN User's Manual. U.S. Department of Agriculture, Forest Service, Systems Application Group for Land Management Planning: Fort Collins CO.

USFS. 1986a. Record of Decision and Summary, Final Environmental Impact Statement and Land and Resource Management Plan: Manti-LaSal National Forest. November 1986. U.S. Department of Agriculture, Forest Service. Price UT.

USFS. 1986b. Record of Decision and Summary, Final Environmental Impact Statement and Land and Resource Management Plan: Fishlake National Forest. June 1986. U.S. Department of Agriculture, Forest Service. Richfield UT.

USFWS. 1982. 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. November 1982. U.S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, Bureau of the Census. Washington D.C.

USGS. 1979. Final Environmental Statement: Development of Coal Resources in Central Utah. Regional Analysis, Part I. U.S. Department of the Interior, Geological Survey.

Utah. 1985. Annual reports to the Utah State Tax Commission. (Unpublished.) Individual summaries from counties, cities, school districts, and special service districts, obtained by request from the Utah State Tax Commission, Salt Lake City.

Utah. 1987. "Utah 1986 City Population and 1985 Per Capita Income Estimates." Utah Data Guide. Vol. 6, No. 4. Utah Office of Planning and Budget, Data Resources Section. Salt Lake City UT.

Utah State Tax Commission. 1986. Assessment/ Sales Ratio Study. January 1987. Utah State Tax Commission, Property Tax Division, Salt Lake City.

Webb, Robert H. and Wilshire, Howard G. 1983. Environmental Effects of Off-Road Vehicles. Springer-Verlag New York, Inc.: New York NY.

Wennergren, Boyd, et al. 1973. Estimation of Quality and Location Values for Resident Deer Hunting in Utah. Bulletin 448. Utah Agricultural Experiment Station, Utah State University: Logan.

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